

**If you plan to submit a bid directly to the Department of Transportation**

**PREQUALIFICATION**

Any contractor who desires to become pre-qualified to bid on work advertised by IDOT must submit the properly completed pre-qualification forms to the Bureau of Construction no later than 4:30 p.m. prevailing time twenty-one days prior to the letting of interest. This pre-qualification requirement applies to first time contractors, contractors renewing expired ratings, contractors maintaining continuous pre-qualification or contractors requesting revised ratings. To be eligible to bid, existing pre-qualification ratings must be effective through the date of letting.

**REQUESTS FOR AUTHORIZATION TO BID**

Contractors downloading and/or ordering CD-ROM's and are wanting to bid on items included in a particular letting must submit the properly completed "Request for Authorization to Bid/or Not For Bid Status" (BDE 124INT) and the ORIGINAL "Affidavit of Availability" (BC 57) to the proper office no later than 4:30 p.m. prevailing time, three (3) days prior to the letting date.

**WHO CAN BID ?**

Bids will be accepted from only those companies that request and receive written **Authorization to Bid** from IDOT's Central Bureau of Construction.

**WHAT CONSTITUTES WRITTEN AUTHORIZATION TO BID?:** When a prospective prime bidder submits a "Request for Authorization to Bid/or Not For Bid Status" (BDE 124INT) he/she must indicate at that time which items are being requested For Bidding purposes. Only those items requested For Bidding will be analyzed. After the request has been analyzed, the bidder will be issued a **Proposal Denial and/or Authorization Form**, approved by the Central Bureau of Construction, that indicates which items have been approved For Bidding. If **Authorization to Bid** cannot be approved, the **Proposal Denial and/or Authorization Form** will indicate the reason for denial.

**ABOUT AUTHORIZATION TO BID:** Firms that have not received an authorization form within a reasonable time of complete and correct original document submittal should contact the department as to status. This is critical in the week before the letting. These documents must be received three days before the letting date. Firms unsure as to authorization status should call the Prequalification Section of the Bureau of Construction at the number listed at the end of these instructions.

**ADDENDA:** It is the contractor's responsibility to determine which, if any, addenda pertains to any project they may be bidding. Failure to incorporate all relevant addenda may cause the bid to be declared unacceptable.

Each addendum will be placed with the contract number. Addenda will also be placed on the Addendum/Revision Checksheet and each subscription service subscriber will be notified by e-mail of each addendum issued.

The Internet is the Department's primary way of doing business. The subscription server e-mails are an added courtesy the Department provides. It is suggested that bidder check IDOT's website <http://www.dot.il.gov/desenv/delett.html> before submitting final bid information.

**IDOT is not responsible for any e-mail related failures.**

Addenda Questions may be directed to the Contracts Office at (217)-782-7806 or [D&Econtracts@dot.il.gov](mailto:D&Econtracts@dot.il.gov)

Technical Questions about downloading these files may be directed to Roseanne Nance (217)-785-5875 or [nancer@dot.il.gov](mailto:nancer@dot.il.gov)

**WHAT MUST BE INCLUDED WHEN BIDS ARE SUBMITTED?:** Bidders need not return the entire proposal when bids are submitted. That portion of the proposal that must be returned includes the following:

1. All documents from the Proposal Cover Sheet through the Proposal Bid Bond
2. Other special documentation and/or information that may be required by the contract special provisions

All proposal documents, including Proposal Guaranty Checks or Proposal Bid Bonds, should be stapled together to prevent loss when bids are processed by IDOT personnel.

**ABOUT SUBMITTING BIDS:** It is recommended that bidders deliver bids in person to insure they arrive at the proper location prior to the time specified for the receipt of bids. Any bid received at the place of letting after the time specified will not be accepted.

**WHO SHOULD BE CALLED IF ASSISTANCE IS NEEDED?**

<b>Questions Regarding</b>	<b>Call</b>
Prequalification and/or Authorization to Bid	217/782-3413
Preparation and submittal of bids	217/782-7806
Mailing of plans and proposals	217/782-7806
Electronic plans and proposals	217/785-5875

**ADDENDUMS TO THE PROPOSAL FORMS**

Planholders should verify that they have received and incorporated the revisions prior to submitting their bid. Failure by the bidder to include an addendum could result in a bid being rejected as irregular.

# 52

RETURN WITH BID

Proposal Submitted By

Name

Address

City

Letting November 5, 2004

BIDDERS NEED NOT RETURN THE ENTIRE PROPOSAL  
(See instructions inside front cover)

## NOTICE TO PROSPECTIVE BIDDERS

This proposal can be used for bidding purposes  
by only those companies that request and receive  
written AUTHORIZATION TO BID from IDOT's  
Central Bureau of Construction.

(SEE INSTRUCTIONS ON THE INSIDE OF COVER)

# Notice To Bidders, Specifications, Proposal, Contract and Contract Bond



Illinois Department  
of Transportation

Springfield, Illinois 62764

Contract No. 83664  
DUPAGE County  
Section 96-00099-00-BR (Naperville)  
Route MAIN STREET  
Project BROS-D1(487)  
District 1 Construction Funds

PLEASE MARK THE APPROPRIATE BOX BELOW:

☐ A Bid Bond is included.

☐ A Cashier's Check or a Certified Check is included

Prepared by

F

Checked by

(Printed by authority of the State of Illinois)

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## INSTRUCTIONS

**ABOUT IDOT PROPOSALS:** All proposals issued by IDOT are potential bidding proposals. Each proposal contains all Certifications and Affidavits, a Proposal Signature Sheet and a Proposal Bid Bond required for Prime Contractors to submit a bid after written **Authorization to Bid** has been issued by IDOT's Central Bureau of Construction.

**HOW MANY PROPOSALS SHOULD PROSPECTIVE BIDDERS REQUEST?:** Prospective bidders should, prior to submitting their initial request for plans and proposals, determine their needs and request the total number of plans and proposals needed for each item requested. There will be a nonrefundable charge of \$15 for each set of plans and specifications issued.

**WHO CAN BID?:** Bids will be accepted from only those companies that request and receive written **Authorization to Bid** from IDOT's Central Bureau of Construction. To request authorization, a potential bidder must complete and submit Part B of the Request for Proposal Forms and Plans & Request for Authorization to Bid form (BDE 124) and submit an original Affidavit of Availability (BC 57).

**WHAT CONSTITUTES WRITTEN AUTHORIZATION TO BID?:** When a prospective prime bidder submits a "Request for Proposal Forms and Plans" he/she must indicate at that time which items are being requested For Bidding purposes. Only those items requested For Bidding will be analyzed. After the request has been analyzed, the bidder will be issued a **Proposal Denial and/or Authorization Form**, approved by the Central Bureau of Construction, that indicates which items have been approved For Bidding. If **Authorization to Bid** cannot be approved, the **Proposal Denial and/or Authorization Form** will indicate the reason for denial. If a contractor has requested to bid but has not received a **Proposal Denial and/or Authorization Form**, they should contact the Central Bureau of Construction in advance of the letting date.

**WHAT MUST BE INCLUDED WHEN BIDS ARE SUBMITTED?:** Bidders need not return the entire proposal when bids are submitted. That portion of the proposal that must be returned includes the following:

1. All documents from the Proposal Cover Sheet through the Proposal Bid Bond
2. Other special documentation and/or information that may be required by the contract special provisions

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### WHO SHOULD BE CALLED IF ASSISTANCE IS NEEDED?

Questions Regarding	Call
Prequalification and/or Authorization to Bid	217/782-3413
Preparation and submittal of bids	217/782-7806
Mailing of plans and proposals	217/782-7806

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## RETURN WITH BID



**Illinois Department  
of Transportation**

## PROPOSAL

TO THE DEPARTMENT OF TRANSPORTATION

1. Proposal of \_\_\_\_\_  
\_\_\_\_\_

for the improvement identified and advertised for bids in the Invitation for Bids as:

**Contract No. 83664  
DUPAGE County  
Section 96-00099-00-BR (Naperville)  
Project BROS-D1(487)  
Route MAIN STREET  
District 1 Construction Funds**

**Construction consists of the removal and reconstruction of the Main Street Bridge over the west branch of the DuPage River between Walter Street and Chicago Avenue in Naperville.**

2. The undersigned bidder will furnish all labor, material and equipment to complete the above described project in a good and workmanlike manner as provided in the contract documents provided by the Department of Transportation. This proposal will become part of the contract and the terms and conditions contained in the contract documents shall govern performance and payments.

## RETURN WITH BID

3. **ASSURANCE OF EXAMINATION AND INSPECTION/WAIVER.** The undersigned further declares that he/she has carefully examined the proposal, plans, specifications, form of contract and contract bond, and special provisions, and that he/she has inspected in detail the site of the proposed work, and that he/she has familiarized themselves with all of the local conditions affecting the contract and the detailed requirements of construction, and understands that in making this proposal he/she waives all right to plead any misunderstanding regarding the same.
4. **EXECUTION OF CONTRACT AND CONTRACT BOND.** The undersigned further agrees to execute a contract for this work and present the same to the department within fifteen (15) days after the contract has been mailed to him/her. The undersigned further agrees that he/she and his/her surety will execute and present within fifteen (15) days after the contract has been mailed to him/her contract bond satisfactory to and in the form prescribed by the Department of Transportation, in the penal sum of the full amount of the contract, guaranteeing the faithful performance of the work in accordance with the terms of the contract.
5. **PROPOSAL GUARANTY.** Accompanying this proposal is either a bid bond on the department form, executed by a corporate surety company satisfactory to the department, or a proposal guaranty check consisting of a bank cashier's check or a properly certified check for not less than 5 per cent of the amount bid or for the amount specified in the following schedule:

<u>Amount of Bid</u>			<u>Proposal Guaranty</u>	<u>Amount of Bid</u>			<u>Proposal Guaranty</u>
Up to		\$5,000 .....	\$150	\$2,000,000	to	\$3,000,000 .....	\$100,000
\$5,000	to	\$10,000 .....	\$300	\$3,000,000	to	\$5,000,000 .....	\$150,000
\$10,000	to	\$50,000 .....	\$1,000	\$5,000,000	to	\$7,500,000 .....	\$250,000
\$50,000	to	\$100,000 .....	\$3,000	\$7,500,000	to	\$10,000,000 .....	\$400,000
\$100,000	to	\$150,000 .....	\$5,000	\$10,000,000	to	\$15,000,000 .....	\$500,000
\$150,000	to	\$250,000 .....	\$7,500	\$15,000,000	to	\$20,000,000 .....	\$600,000
\$250,000	to	\$500,000 .....	\$12,500	\$20,000,000	to	\$25,000,000 .....	\$700,000
\$500,000	to	\$1,000,000 .....	\$25,000	\$25,000,000	to	\$30,000,000 .....	\$800,000
\$1,000,000	to	\$1,500,000 .....	\$50,000	\$30,000,000	to	\$35,000,000 .....	\$900,000
\$1,500,000	to	\$2,000,000 .....	\$75,000	over		\$35,000,000 .....	\$1,000,000

Bank cashier's checks or properly certified checks accompanying proposals shall be made payable to the Treasurer, State of Illinois, when the state is awarding authority; the county treasurer, when a county is the awarding authority; or the city, village, or town treasurer, when a city, village, or town is the awarding authority.

If a combination bid is submitted, the proposal guaranties which accompany the individual proposals making up the combination will be considered as also covering the combination bid.

The amount of the proposal guaranty check is \_\_\_\_\_ \$(\_\_\_\_\_). If this proposal is accepted and the undersigned shall fail to execute a contract bond as required herein, it is hereby agreed that the amount of the proposal guaranty shall become the property of the State of Illinois, and shall be considered as payment of damages due to delay and other causes suffered by the State because of the failure to execute said contract and contract bond; otherwise, the bid bond shall become void or the proposal guaranty check shall be returned to the undersigned.

**Attach Cashier's Check or Certified Check Here**

In the event that one proposal guaranty check is intended to cover two or more proposals, the amount must be equal to the sum of the proposal guaranties which would be required for each individual proposal. If the guaranty check is placed in another proposal, state below where it may be found.

The proposal guaranty check will be found in the proposal for:

Item \_\_\_\_\_

Section No. \_\_\_\_\_

County \_\_\_\_\_

**Mark the proposal cover sheet as to the type of proposal guaranty submitted.**

BD 354 (Rev. 11/2001)

## RETURN WITH BID

6. **COMBINATION BIDS.** The undersigned further agrees that if awarded the contract for the sections contained in the following combination, he/she will perform the work in accordance with the requirements of each individual proposal comprising the combination bid specified in the schedule below, and that the combination bid shall be prorated against each section in proportion to the bid submitted for the same. If an error is found to exist in the gross sum bid for one or more of the individual sections included in a combination, the combination bid shall be corrected as provided in the specifications.

**When a combination bid is submitted, the schedule below must be completed in each proposal comprising the combination.**

**If alternate bids are submitted for one or more of the sections comprising the combination, a combination bid must be submitted for each alternate.**

**Schedule of Combination Bids**

Combination No.	Sections Included in Combination	Combination Bid	
		Dollars	Cents

7. **SCHEDULE OF PRICES.** The undersigned bidder submits herewith, in accordance with the rules and instructions, a schedule of prices for the items of work for which bids are sought. The unit prices bid are in U.S. dollars and cents, and all extensions and summations have been made. The bidder understands that the quantities appearing in the bid schedule are approximate and are provided for the purpose of obtaining a gross sum for the comparison of bids. If there is an error in the extension of the unit prices, the unit prices shall govern. Payment to the contractor awarded the contract will be made only for actual quantities of work performed and accepted or materials furnished according to the contract. The scheduled quantities of work to be done and materials to be furnished may be increased, decreased or omitted as provided elsewhere in the contract.
8. **CERTIFICATE OF AUTHORITY.** The undersigned bidder, if a business organized under the laws of another State, assures the Department that it will furnish a copy of its certificate of authority to do business in the State of Illinois with the return of the executed contract and bond. Failure to furnish the certificate within the time provided for execution of an awarded contract may be cause for cancellation of the award and forfeiture of the proposal guaranty to the State.

STATE JOB #- C-91-139-96  
PPS NBR - 1-10123-0000

ILLINOIS DEPARTMENT OF TRANSPORTATION  
SCHEDULE OF PRICES  
CONTRACT NUMBER - 83664

ECMS081 DTGECM03 ECMR003 PAGE 1  
RUN DATE - 10/04/04  
RUN TIME - 084558

COUNTY NAME	CODE	DIST	SECTION NUMBER	PROJECT NUMBER	ROUTE
DUPAGE	043	01	96-00099-00-BR (NAPERVILLE)	BROS-00D1/487/000	MAIN STR.

ITEM NUMBER	PAY ITEM DESCRIPTION	UNIT OF MEASURE	QUANTITY	UNIT PRICE		TOTAL PRICE	
				DOLLARS	CENTS	DOLLARS	CTS
XX003068	ELAST BEARING PAD SPL	SQ FT	631.000 X			=	
XX004080	F&I STRESS PT-TEN TEN	L SUM	1.000 X			=	
XX004471	PCC UNDERLAYMENT 6	SQ FT	300.000 X			=	
XX005941	MAIN EX SHEP LIGHTING	L SUM	1.000 X			=	
XX005942	L STD SOD VAP AC 100W	EACH	6.000 X			=	
XX005943	F L GR M 100W MET HAL	EACH	2.000 X			=	
XX005944	F L GR M 175W MET HAL	EACH	2.000 X			=	
XX005945	REM BR SERV POLE WIRE	EACH	1.000 X			=	
XX005946	EC C 600V 2/XLP 3/C10	FOOT	50.000 X			=	
XX005947	LOW FLOW WALK SPECIAL	L SUM	1.000 X			=	
XX005948	CON SLOPEWALL SPECIAL	SQ FT	1,209.000 X			=	
XX005949	DR STRUCTURES CLEANED	EACH	4.000 X			=	
XX005950	SS DI C-52 12	FOOT	77.000 X			=	
XX005951	REM/REP EX STONE WALL	SQ FT	60.000 X			=	
XX005952	SEGMENTAL CON BL WALL	SQ YD	78.000 X			=	

MAIN STR.  
96-00099-00-BR (NAPERVILLE)  
DUPAGE

ILLINOIS DEPARTMENT OF TRANSPORTATION  
SCHEDULE OF PRICES  
CONTRACT NUMBER - 83664

ECMS081 DTGECM03 ECMR003 PAGE 2  
RUN DATE - 10/04/04  
RUN TIME - 084558

ITEM NUMBER	PAY ITEM DESCRIPTION	UNIT OF MEASURE	QUANTITY		UNIT PRICE		TOTAL PRICE	
					DOLLARS	CENTS	DOLLARS	CTS
XX005953	TEM CHAINLINK FENCE 8	FOOT	780.000	X			=	
XX005954	PEDESTRIAN PROTECTION	FOOT	100.000	X			=	
XX005955	TEMPORARY DRAINAGE	L SUM	1.000	X			=	
XX005956	TEMP ACCESS ROAD SPEC	EACH	1.000	X			=	
XX005957	CONCRETE CURB SPECIAL	FOOT	8.000	X			=	
XX005958	GATE VALVE & VAULT 12	EACH	2.000	X			=	
XX005959	GATE VALVE & VAULT 8	EACH	1.000	X			=	
XX005960	LINE STOP 8	EACH	1.000	X			=	
XX005961	LINE STOP 6	EACH	1.000	X			=	
XX005962	BENCH	EACH	2.000	X			=	
XX005963	ANTI-GRAFFITI COATING	SQ FT	5,044.000	X			=	
XX005964	REM/RESET BR SIDEWALK	SQ FT	420.000	X			=	
XX005965	PCC HEADER BANDING	FOOT	10.000	X			=	
XX005966	ENTRY COLUMN	EACH	2.000	X			=	
XX005967	TOPSOIL PLANT MIXTURE	CU YD	0.400	X			=	

MAIN STR.  
96-00099-00-BR (NAPERVILLE)  
DUPAGE

ILLINOIS DEPARTMENT OF TRANSPORTATION  
SCHEDULE OF PRICES  
CONTRACT NUMBER - 83664

ECMS081 DTGECM03 ECMR003 PAGE 3  
RUN DATE - 10/04/04  
RUN TIME - 084558

ITEM NUMBER	PAY ITEM DESCRIPTION	UNIT OF MEASURE	QUANTITY		UNIT PRICE		TOTAL PRICE	
					DOLLARS	CENTS	DOLLARS	CTS
XX005968	TURBIDITY CURTAIN	SQ YD	50.000	X			=	
XX005969	STONE FINISHES COLUMN	EACH	10.000	X			=	
XX005970	UNDERWAT STR EXC PROT	L SUM	1.000	X			=	
XX005971	TRAFFIC BARRIER RAIL	FOOT	262.000	X			=	
XX005972	STAMPED ASP CROSSWALK	SQ YD	195.000	X			=	
XX005973	6WAY PVC DUCT B 6X6 D	FOOT	360.000	X			=	
XX005974	TYPE G MH INSTALL	EACH	1.000	X			=	
XX005975	VIDEO TAPE	UNIT	1.000	X			=	
XX005976	TRENCH BACKFILL CA 6	CU YD	132.000	X			=	
XX005977	CONT LOW STR MATERIAL	CU YD	10.000	X			=	
XX005978	GROUND ROD SYST INST	EACH	4.000	X			=	
XX005979	ROD AND MANDREL	FOOT	2,160.000	X			=	
XX005980	PULL ROPE & DETEC M T	FOOT	360.000	X			=	
XX005981	COUNTERPOISE PAVED	FOOT	260.000	X			=	
XX005982	HAND DIG 0-5 IN PAVT	CU YD	5.000	X			=	

MAIN STR.  
96-00099-00-BR (NAPERVILLE)  
DUPAGE

ILLINOIS DEPARTMENT OF TRANSPORTATION  
SCHEDULE OF PRICES  
CONTRACT NUMBER - 83664

ECMS081 DTGECM03 ECMR003 PAGE 4  
RUN DATE - 10/04/04  
RUN TIME - 084558

ITEM NUMBER	PAY ITEM DESCRIPTION	UNIT OF MEASURE	QUANTITY	UNIT PRICE		TOTAL PRICE	
				DOLLARS	CENTS	DOLLARS	CTS
XX005983	HAND DIG 5-20 IN PAVT	CU YD	5.000 X			=	
XX005984	HAND DIG 0-5 UNP AREA	CU YD	5.000 X			=	
XX005985	HAND DIG 5-20 UP AREA	CU YD	5.000 X			=	
XX005986	MACH AID DIG 0-5 PAVT	CU YD	5.000 X			=	
XX005987	MACH AID DIG 5-20 PVT	CU YD	5.000 X			=	
XX005988	MACH AID DIG 0-5 UP A	CU YD	5.000 X			=	
XX005989	MACH AID DIG 5-20 UPA	CU YD	5.000 X			=	
XX005990	ADJ MH FR COVER RINGS	EACH	1.000 X			=	
XX005991	CONN EXIST MH CORE DR	EACH	3.000 X			=	
XX005992	TREE ALN INC GA 3" CAL	EACH	3.000 X			=	
XX005993	TREE NYSS SYLV 3" CAL	EACH	3.000 X			=	
XX005994	TREE HAMMA VIRG 3" CAL	EACH	1.000 X			=	
XX005995	SHRUB SUMMER SW 5 GAL	EACH	7.000 X			=	
XX005996	SHRUB ROS RU AL 5 GAL	EACH	11.000 X			=	
XX005997	SHRUB SNOWBERRY 5 GAL	EACH	9.000 X			=	

MAIN STR.  
96-00099-00-BR (NAPERVILLE)  
DUPAGE

ILLINOIS DEPARTMENT OF TRANSPORTATION  
SCHEDULE OF PRICES  
CONTRACT NUMBER - 83664

ECMS081 DTGECM03 ECMR003 PAGE 5  
RUN DATE - 10/04/04  
RUN TIME - 084558

ITEM NUMBER	PAY ITEM DESCRIPTION	UNIT OF MEASURE	QUANTITY	UNIT PRICE		TOTAL PRICE	
				DOLLARS	CENTS	DOLLARS	CTS
XX005999	SHRUB ILEX GLAB 5 GAL	EACH	13.000	X	=		
XX006000	SHRUB ARON MELA 5 GAL	EACH	7.000	X	=		
XX006001	GRASSES CAR MUS 1 GAL	EACH	20.000	X	=		
XX006003	GRASSES PAN VIR 3 GAL	EACH	15.000	X	=		
XX006004	PLUGS SCIR VAL 3 POT	EACH	30.000	X	=		
XX006005	PLUGS SPAR PEC 3 POT	EACH	30.000	X	=		
XX006006	PLUGS CAREX LAN 3 POT	EACH	30.000	X	=		
XX006007	PLUGS JUN TORRI 3 POT	EACH	30.000	X	=		
XX006008	PLUGS SCIR ATRO 3 POT	EACH	30.000	X	=		
XX006009	PLUGS JUN EFFUC 3 POT	EACH	30.000	X	=		
XX006010	PLUGS PAN VIRGA 3 POT	EACH	30.000	X	=		
XX006011	PLUGS CAREX COS 3 POT	EACH	30.000	X	=		
XX006012	PLUGS CALAM CAN 3 POT	EACH	30.000	X	=		
XX006013	PLUGS CAREX VUL 3 POT	EACH	30.000	X	=		
XX006014	GRNDCOVER PAR QUI 3"P	SQ FT	200.000	X	=		



MAIN STR.  
96-00099-00-BR (NAPERVILLE)  
DUPAGE

ILLINOIS DEPARTMENT OF TRANSPORTATION  
SCHEDULE OF PRICES  
CONTRACT NUMBER - 83664

ECMS081 DTGECM03 ECMR003 PAGE 6  
RUN DATE - 10/04/04  
RUN TIME - 084558

ITEM NUMBER	PAY ITEM DESCRIPTION	UNIT OF MEASURE	QUANTITY	UNIT PRICE		TOTAL PRICE	
				DOLLARS	CENTS	DOLLARS	CTS
XX006015	EROS CONTR BL C125 BN	SQ FT	500.000	X		=	
X0300635	PLANTER	EACH	4.000	X		=	
X0322256	TEMP INFO SIGNING	SQ FT	100.000	X		=	
X0323080	DRAINAGE SCUPPR DS-12	EACH	4.000	X		=	
X0323341	BR EXP JOINT SYSTEM	FOOT	136.000	X		=	
X0323397	HP CONC SUP-STR	CU YD	590.000	X		=	
X0323988	TEMP SOIL RETEN SYSTM	SQ FT	1,449.000	X		=	
X0540000	BRICK PAVERS	SQ FT	4,210.000	X		=	
X3550500	BIT BC SUPER 8	SQ YD	662.000	X		=	
X4066426	BC SC SUPER "D" N70	TON	124.000	X		=	
X4066616	BCBC SUP IL-19.0 N70	TON	207.000	X		=	
X4066770	LEV BIND MM SUPER N70	TON	46.000	X		=	
X7015000	CHANGEABLE MESSAGE SN	CAL MO	22.000	X		=	
Z0002600	BAR SPLICERS	EACH	94.000	X		=	
Z0006100	BR DK LATEX CON OVLAY	SQ YD	515.000	X		=	

MAIN STR.  
96-00099-00-BR (NAPERVILLE)  
DUPAGE

ILLINOIS DEPARTMENT OF TRANSPORTATION  
SCHEDULE OF PRICES  
CONTRACT NUMBER - 83664

ECMS081 DTGECM03 ECMR003 PAGE 7  
RUN DATE - 10/04/04  
RUN TIME - 084558

ITEM NUMBER	PAY ITEM DESCRIPTION	UNIT OF MEASURE	QUANTITY		UNIT PRICE		TOTAL PRICE	
					DOLLARS	CENTS	DOLLARS	CTS
Z0008230	DRIL SHAFT/SOIL 30	FOOT	146.000	X			=	
Z0008324	DRIL SHAFT/ROCK 24	FOOT	86.000	X			=	
Z0013798	CONSTRUCTION LAYOUT	L SUM	1.000	X			=	
Z0076600	TRAINEES	HOOR	2,000.000	X	0.80		=	1,600.00
20100110	TREE REMOV 6-15	UNIT	44.000	X			=	
20101000	TEMPORARY FENCE	FOOT	200.000	X			=	
20101100	TREE TRUNK PROTECTION	EACH	9.000	X			=	
20200100	EARTH EXCAVATION	CU YD	184.000	X			=	
20200200	ROCK EXCAVATION	CU YD	35.000	X			=	
20300200	ROCK EXCAV CHANNEL	CU YD	85.000	X			=	
20700220	POROUS GRAN EMBANK	CU YD	363.000	X			=	
20800150	TRENCH BACKFILL	CU YD	335.000	X			=	
21101625	TOPSOIL F & P 6	SQ YD	127.000	X			=	
25000310	SEEDING CL 4	ACRE	0.250	X			=	
25000400	NITROGEN FERT NUTR	POUND	25.000	X			=	

MAIN STR.  
96-00099-00-BR (NAPERVILLE)  
DUPAGE

ILLINOIS DEPARTMENT OF TRANSPORTATION  
SCHEDULE OF PRICES  
CONTRACT NUMBER - 83664

ECMS081 DTGECM03 ECMR003 PAGE 8  
RUN DATE - 10/04/04  
RUN TIME - 084558

ITEM NUMBER	PAY ITEM DESCRIPTION	UNIT OF MEASURE	QUANTITY	UNIT PRICE		TOTAL PRICE	
				DOLLARS	CENTS	DOLLARS	CTS
25000500	PHOSPHORUS FERT NUTR	POUND	25.000 X		=		
25000600	POTASSIUM FERT NUTR	POUND	25.000 X		=		
25100630	EROSION CONTR BLANKET	SQ YD	130.000 X		=		
28000250	TEMP EROS CONTR SEED	POUND	25.000 X		=		
28000400	PERIMETER EROS BAR	FOOT	300.000 X		=		
28000510	INLET FILTERS	EACH	4.000 X		=		
28100109	STONE RIPRAP CL A5	SQ YD	41.000 X		=		
31101200	SUB GRAN MAT B 4	SQ YD	733.000 X		=		
40300200	BIT MATLS PR CT	TON	3.100 X		=		
40600980	BIT SURF REM BUTT JT	SQ YD	85.000 X		=		
42001300	PROTECTIVE COAT	SQ YD	76.000 X		=		
42001400	BR APPROACH PAVT SPL	SQ YD	294.000 X		=		
42001430	BR APPR PVT CON (FLX)	SQ YD	81.000 X		=		
42400200	PC CONC SIDEWALK 5	SQ FT	270.000 X		=		
44000009	BIT SURF REM 3	SQ YD	545.000 X		=		

MAIN STR.  
96-00099-00-BR (NAPERVILLE)  
DUPAGE

ILLINOIS DEPARTMENT OF TRANSPORTATION  
SCHEDULE OF PRICES  
CONTRACT NUMBER - 83664

ECMS081 DTGECM03 ECMR003 PAGE 9  
RUN DATE - 10/04/04  
RUN TIME - 084558

ITEM NUMBER	PAY ITEM DESCRIPTION	UNIT OF MEASURE	QUANTITY	UNIT PRICE		TOTAL PRICE	
				DOLLARS	CENTS	DOLLARS	CTS
44000100	PAVEMENT REM	SQ YD	865.000 X			=	
44000500	COMB CURB GUTTER REM	FOOT	290.000 X			=	
44000600	SIDEWALK REM	SQ FT	1,955.000 X			=	
44000700	APPROACH SLAB REM	SQ YD	150.000 X			=	
44001113	BIT CONC SUR RM (ASB)	SQ YD	463.000 X			=	
50100200	REM EXIST STRUCT	L SUM	1.000 X			=	
50200100	STRUCTURE EXCAVATION	CU YD	1,085.000 X			=	
50200400	ROCK EXC STRUCT	CU YD	83.000 X			=	
50300225	CONC STRUCT	CU YD	288.300 X			=	
50300255	CONC SUP-STR	CU YD	58.000 X			=	
50300260	BR DECK GROOVING	SQ YD	518.000 X			=	
50300300	PROTECTIVE COAT	SQ YD	609.000 X			=	
50300510	RUSTICATION FINISH	SQ FT	2,034.000 X			=	
50800205	REINF BARS, EPOXY CTD	POUND	126,600.000 X			=	
50900805	PEDESTRIAN RAIL	FOOT	249.000 X			=	

MAIN STR.  
96-00099-00-BR (NAPERVILLE)  
DUPAGE

ILLINOIS DEPARTMENT OF TRANSPORTATION  
SCHEDULE OF PRICES  
CONTRACT NUMBER - 83664

ECMS081 DTGECM03 ECMR003 PAGE 10  
RUN DATE - 10/04/04  
RUN TIME - 084558

ITEM NUMBER	PAY ITEM DESCRIPTION	UNIT OF MEASURE	QUANTITY	UNIT PRICE		TOTAL PRICE	
				DOLLARS	CENTS	DOLLARS	CTS
51204315	CONCRETE ENCASEMENT	CU YD	80.000	X	=		
51500100	NAME PLATES	EACH	1.000	X	=		
55037200	SS 3 RCEP S76 R48	FOOT	36.000	X	=		
55100500	STORM SEWER REM 12	FOOT	30.000	X	=		
56103000	D I WATER MAIN 6	FOOT	26.000	X	=		
56103300	D I WATER MAIN 12	FOOT	318.000	X	=		
56200200	WATER SERV LINE 3/4	FOOT	40.000	X	=		
56400500	FIRE HYDNTS TO BE REM	EACH	1.000	X	=		
56400820	FIRE HYD W/AUX V & VB	EACH	1.000	X	=		
58700200	BRIDGE SEAT SEALER	SQ FT	330.000	X	=		
59100100	GEOCOMPOSITE WALL DR	SQ YD	137.000	X	=		
60107700	PIPE UNDERDRAINS 6	FOOT	30.000	X	=		
60109582	P UNDR FOR STRUCT 6	FOOT	136.000	X	=		
60218400	MAN TA 4 DIA T1F CL	EACH	1.000	X	=		
60255500	MAN ADJUST	EACH	5.000	X	=		

MAIN STR.  
96-00099-00-BR (NAPERVILLE)  
DUPAGE

ILLINOIS DEPARTMENT OF TRANSPORTATION  
SCHEDULE OF PRICES  
CONTRACT NUMBER - 83664

ECMS081 DTGECM03 ECMR003 PAGE 11  
RUN DATE - 10/04/04  
RUN TIME - 084558

ITEM NUMBER	PAY ITEM DESCRIPTION	UNIT OF MEASURE	QUANTITY	UNIT PRICE		TOTAL PRICE	
				DOLLARS	CENTS	DOLLARS	CTS
60265700	VV ADJUST	EACH	1.000 X				
60266500	VV REMOVED	EACH	4.000 X				
60603800	COMB CC&G TB6.12	FOOT	151.000 X				
60608300	COMB CC&G TM2.12	FOOT	60.000 X				
66410300	CH LK FENCE REMOV	FOOT	14.000 X				
67000400	ENGR FIELD OFFICE A	CAL MO	12.000 X				
67100100	MOBILIZATION	L SUM	1.000 X				
70101800	TRAF CONT & PROT SPL	L SUM	1.000 X				
70102550	TR CONT-PROT TEMP DET	EACH	1.000 X				
70300510	PAVT MARK TAPE T3 L&S	SQ FT	32.000 X				
70300520	PAVT MARK TAPE T3 4	FOOT	600.000 X				
70300570	PAVT MARK TAPE T3 24	FOOT	20.000 X				
70301000	WORK ZONE PAVT MK REM	SQ FT	140.000 X				
70400100	TEMP CONC BARRIER	FOOT	150.000 X				
70400200	REL TEMP CONC BARRIER	FOOT	100.000 X				

MAIN STR.  
96-00099-00-BR (NAPERVILLE)  
DUPAGE

ILLINOIS DEPARTMENT OF TRANSPORTATION  
SCHEDULE OF PRICES  
CONTRACT NUMBER - 83664

ECMS081 DTGECM03 ECMR003 PAGE 12  
RUN DATE - 10/04/04  
RUN TIME - 084558

ITEM NUMBER	PAY ITEM DESCRIPTION	UNIT OF MEASURE	QUANTITY	UNIT PRICE		TOTAL PRICE	
				DOLLARS	CENTS	DOLLARS	CTS
70400300	TEMP CON BAR TERM SEC	EACH	2.000 X			=	
72000100	SIGN PANEL T1	SQ FT	4.000 X			=	
72400310	REMOV SIGN PANEL T1	SQ FT	16.000 X			=	
72400500	RELOC SIN PAN ASSY TA	EACH	4.000 X			=	
72800100	TELES STL SIN SUPPORT	FOOT	9.000 X			=	
78000100	THPL PVT MK LTR & SYM	SQ FT	125.000 X			=	
78000200	THPL PVT MK LINE 4	FOOT	1,065.000 X			=	
78000400	THPL PVT MK LINE 6	FOOT	115.000 X			=	
78000600	THPL PVT MK LINE 12	FOOT	42.000 X			=	
78000650	THPL PVT MK LINE 24	FOOT	95.000 X			=	
78003110	PREF PL PM TB LINE 4	FOOT	450.000 X			=	
78003150	PREF PL PM TB LINE 12	FOOT	100.000 X			=	
78003180	PREF PL PM TB LINE 24	FOOT	21.000 X			=	
78300100	PAVT MARKING REMOVAL	SQ FT	290.000 X			=	
80400100	ELECT SERV INSTALL	EACH	1.000 X			=	

MAIN STR.  
96-00099-00-BR (NAPERVILLE)  
DUPAGE

ILLINOIS DEPARTMENT OF TRANSPORTATION  
SCHEDULE OF PRICES  
CONTRACT NUMBER - 83664

ECMS081 DTGECM03 ECMR003 PAGE 13  
RUN DATE - 10/04/04  
RUN TIME - 084558

ITEM NUMBER	PAY ITEM DESCRIPTION	UNIT OF MEASURE	QUANTITY	UNIT PRICE		TOTAL PRICE	
				DOLLARS	CENTS	DOLLARS	CTS
80400200	ELECT UTIL SERV CONN	L SUM	1.000 X		=		
81012200	CON T 3/4 PVC	FOOT	80.000 X		=		
81012600	CON T 2 PVC	FOOT	290.000 X		=		
81012800	CON T 3 PVC	FOOT	200.000 X		=		
81200220	CON EMB STR 1.5 PVC	FOOT	120.000 X		=		
81200230	CON EMB STR 2 PVC	FOOT	240.000 X		=		
81304100	JUN BOX EM S 12X12X6	EACH	6.000 X		=		
81400105	HANDHOLE SPL	EACH	3.000 X		=		
81500200	TR & BKFIL F ELECT WK	FOOT	470.000 X		=		
81702110	EC C XLP USE 1C 10	FOOT	300.000 X		=		
81702130	EC C XLP USE 1C 6	FOOT	3,500.000 X		=		
81702400	EC C XLP USE 3-1C 2	FOOT	150.000 X		=		
82500505	LIGHT CONTROLLER SPL	EACH	1.000 X		=		
84400105	RELOC EX LT UNIT	EACH	1.000 X		=		
84500110	REMOV LIGHTING CONTR	EACH	1.000 X		=		



MAIN STR.  
96-00099-00-BR (NAPERVILLE)  
DUPAGE

ILLINOIS DEPARTMENT OF TRANSPORTATION  
SCHEDULE OF PRICES  
CONTRACT NUMBER - 83664

ECMS081 DTGECM03 ECMR003 PAGE 14  
RUN DATE - 10/04/04  
RUN TIME - 084558

ITEM NUMBER	PAY ITEM DESCRIPTION	UNIT OF MEASURE	QUANTITY	UNIT PRICE		TOTAL PRICE	
				DOLLARS	CENTS	DOLLARS	CTS
84500120	REMOV ELECT SERV INST	EACH	1.000 X			=	
84500130	REMOV LTG CONTR FDN	EACH	1.000 X			=	
TOTAL						\$	

NOTE:

1. EACH PAY ITEM SHOULD HAVE A UNIT PRICE AND A TOTAL PRICE.
2. THE UNIT PRICE SHALL GOVERN IF NO TOTAL PRICE IS SHOWN OR IF THERE IS A DISCREPANCY BETWEEN THE PRODUCT OF THE UNIT PRICE MULTIPLIED BY THE QUANTITY.
3. IF A UNIT PRICE IS OMITTED, THE TOTAL PRICE WILL BE DIVIDED BY THE QUANTITY IN ORDER TO ESTABLISH A UNIT PRICE.
4. A BID MAY BE DECLARED UNACCEPTABLE IF NEITHER A UNIT PRICE NOR A TOTAL PRICE IS SHOWN.

## RETURN WITH BID

### **STATE REQUIRED ETHICAL STANDARDS GOVERNING CONTRACT PROCUREMENT: ASSURANCES, CERTIFICATIONS AND DISCLOSURES**

#### **I. GENERAL**

**A.** Article 50 of the Illinois Procurement Code establishes the duty of all State chief procurement officers, State purchasing officers, and their designees to maximize the value of the expenditure of public moneys in procuring goods, services, and contracts for the State of Illinois and to act in a manner that maintains the integrity and public trust of State government. In discharging this duty, they are charged by law to use all available information, reasonable efforts, and reasonable actions to protect, safeguard, and maintain the procurement process of the State of Illinois.

**B.** In order to comply with the provisions of Article 50 and to carry out the duty established therein, all bidders are to adhere to ethical standards established for the procurement process, and to make such assurances, disclosures and certifications required by law. By execution of the Proposal Signature Sheet, the bidder indicates that each of the mandated assurances has been read and understood, that each certification is made and understood, and that each disclosure requirement has been understood and completed.

**C.** In addition to all other remedies provided by law, failure to comply with any assurance, failure to make any disclosure or the making of a false certification shall be grounds for termination of the contract and the suspension or debarment of the bidder.

#### **II. ASSURANCES**

**A.** The assurances hereinafter made by the bidder are each a material representation of fact upon which reliance is placed should the Department enter into the contract with the bidder. The Department may terminate the contract if it is later determined that the bidder rendered a false or erroneous assurance, and the surety providing the performance bond shall be responsible for the completion of the contract.

##### **B. Felons**

1. The Illinois Procurement Code provides:

Section 50-10. Felons. Unless otherwise provided, no person or business convicted of a felony shall do business with the State of Illinois or any state agency from the date of conviction until 5 years after the date of completion of the sentence for that felony, unless no person held responsible by a prosecutorial office for the facts upon which the conviction was based continues to have any involvement with the business.

2. The bidder assures the Department that the award and execution of the contract would not cause a violation of Section 50-10.

##### **C. Conflicts of Interest**

1. The Illinois Procurement Code provides in pertinent part:

Section 50-13. Conflicts of Interest.

(a) Prohibition. It is unlawful for any person holding an elective office in this State, holding a seat in the General Assembly, or appointed to or employed in any of the offices or agencies of state government and who receives compensation for such employment in excess of 60% of the salary of the Governor of the State of Illinois, or who is an officer or employee of the Capital Development Board or the Illinois Toll Highway Authority, or who is the spouse or minor child of any such person to have or acquire any contract, or any direct pecuniary interest in any contract therein, whether for stationery, printing, paper, or any services, materials, or supplies, that will be wholly or partially satisfied by the payment of funds appropriated by the General Assembly of the State of Illinois or in any contract of the Capital Development Board or the Illinois Toll Highway authority.

(b) Interests. It is unlawful for any firm, partnership, association or corporation, in which any person listed in subsection (a) is entitled to receive (i) more than 7 1/2% of the total distributable income or (ii) an amount in excess of the salary of the Governor, to have or acquire any such contract or direct pecuniary interest therein.

(c) Combined interests. It is unlawful for any firm, partnership, association, or corporation, in which any person listed in subsection (a) together with his or her spouse or minor children is entitled to receive (i) more than 15%, in the aggregate, of the total distributable income or (ii) an amount in excess of 2 times the salary of the Governor, to have or acquire any such contract or direct pecuniary interest therein.

(d) Securities. Nothing in this Section invalidates the provisions of any bond or other security previously offered or to be offered for sale or sold by or for the State of Illinois.

(e) Prior interests. This Section does not affect the validity of any contract made between the State and an officer or employee of the State or member of the General Assembly, his or her spouse, minor child or any combination of those persons if that contract was in existence before his or her election or employment as an officer, member, or employee. The contract is voidable, however, if it cannot be completed within 365 days after the officer, member, or employee takes office or is employed.

The current salary of the Governor is \$150,700.00. Sixty percent of the salary is \$90,420.00.

## RETURN WITH BID

2. The bidder assures the Department that the award and execution of the contract would not cause a violation of Section 50-13, or that an effective exemption has been issued by the Board of Ethics to any individual subject to the Section 50-13 prohibitions pursuant to the provisions of Section 50-20 of the Code and Executive Order Number 3 (1998). Information concerning the exemption process is available from the Department upon request.

### **D. Negotiations**

1. The Illinois Procurement Code provides in pertinent part:

Section 50-15. Negotiations.

(a) It is unlawful for any person employed in or on a continual contractual relationship with any of the offices or agencies of State government to participate in contract negotiations on behalf of that office or agency with any firm, partnership, association, or corporation with whom that person has a contract for future employment or is negotiating concerning possible future employment.

2. The bidder assures the Department that the award and execution of the contract would not cause a violation of Section 50-15, and that the bidder has no knowledge of any facts relevant to the kinds of acts prohibited therein.

### **E. Inducements**

1. The Illinois Procurement Code provides:

Section 50-25. Inducement. Any person who offers or pays any money or other valuable thing to any person to induce him or her not to bid for a State contract or as recompense for not having bid on a State contract is guilty of a Class 4 felony. Any person who accepts any money or other valuable thing for not bidding for a State contract or who withholds a bid in consideration of the promise for the payment of money or other valuable thing is guilty of a Class 4 felony.

2. The bidder assures the Department that the award and execution of the contract would not cause a violation of Section 50-25, and that the bidder has no knowledge of any facts relevant to the kinds of acts prohibited therein.

### **F. Revolving Door Prohibition**

1. The Illinois Procurement Code provides:

Section 50-30. Revolving door prohibition. Chief procurement officers, associate procurement officers, State purchasing officers, their designees whose principal duties are directly related to State procurement, and executive officers confirmed by the Senate are expressly prohibited for a period of 2 years after terminating an affected position from engaging in any procurement activity relating to the State agency most recently employing them in an affected position for a period of at least 6 months. The prohibition includes, but is not limited to: lobbying the procurement process; specifying; bidding; proposing bid, proposal, or contract documents; on their own behalf or on behalf of any firm, partnership, association, or corporation. This Section applies only to persons who terminate an affected position on or after January 15, 1999.

2. The bidder assures the Department that the award and execution of the contract would not cause a violation of Section 50-30, and that the bidder has no knowledge of any facts relevant to the kinds of acts prohibited therein.

### **G. Reporting Anticompetitive Practices**

1. The Illinois Procurement Code provides:

Section 50-40. Reporting anticompetitive practices. When, for any reason, any vendor, bidder, contractor, chief procurement officer, State purchasing officer, designee, elected official, or State employee suspects collusion or other anticompetitive practice among any bidders, offerors, contractors, proposers, or employees of the State, a notice of the relevant facts shall be transmitted to the Attorney General and the chief procurement officer.

2. The bidder assures the Department that it has not failed to report any relevant facts concerning the practices addressed in Section 50-40 which may involve the contract for which the bid is submitted.

### **H. Confidentiality**

1. The Illinois Procurement Code provides:

Section 50-45. Confidentiality. Any chief procurement officer, State purchasing officer, designee, or executive officer who willfully uses or allows the use of specifications, competitive bid documents, proprietary competitive information, proposals, contracts, or selection information to compromise the fairness or integrity of the procurement, bidding, or contract process shall be subject to immediate dismissal, regardless of the Personnel code, any contract, or any collective bargaining agreement, and may in addition be subject to criminal prosecution.

2. The bidder assures the Department that it has no knowledge of any fact relevant to the practices addressed in Section 50-45 which may involve the contract for which the bid is submitted.

## RETURN WITH BID

### **I. Insider Information**

1. The Illinois Procurement Act provides:

Section 50-50. Insider information. It is unlawful for any current or former elected or appointed State official or State employee to knowingly use confidential information available only by virtue of that office or employment for actual or anticipated gain for themselves or another person.

2. The bidder assures the Department that it has no knowledge of any facts relevant to the practices addressed in Section 50-50 which may involve the contract for which the bid is submitted.

### **III. CERTIFICATIONS**

**A.** The certifications hereinafter made by the bidder are each a material representation of fact upon which reliance is placed should the Department enter into the contract with the bidder. The Department may terminate the contract if it is later determined that the bidder rendered a false or erroneous certification, and the surety providing the performance bond shall be responsible for completion of the contract.

#### **B. Bribery**

1. The Illinois Procurement Code provides:

Section 50-5. Bribery.

- (a) Prohibition. No person or business shall be awarded a contract or subcontract under this Code who:

- (1) has been convicted under the laws of Illinois or any other state of bribery or attempting to bribe an officer or employee of the State of Illinois or any other state in that officer's or employee's official capacity; or

- (2) has made an admission of guilt of that conduct that is a matter of record but has not been prosecuted for that conduct.

- (b) Businesses. No business shall be barred from contracting with any unit of State or local government as a result of a conviction under this Section of any employee or agent of the business if the employee or agent is no longer employed by the business and:

- (1) the business has been finally adjudicated not guilty; or

- (2) the business demonstrates to the governmental entity with which it seeks to contract, and that entity finds that the commission of the offense was not authorized, requested, commanded, or performed by a director, officer, or high managerial agent on behalf of the business as provided in paragraph (2) of subsection (a) of Section 5-4 of the Criminal Code of 1961.

- (c) Conduct on behalf of business. For purposes of this Section, when an official, agent, or employee of a business committed the bribery or attempted bribery on behalf of the business and in accordance with the direction or authorization of a responsible official of the business, the business shall be chargeable with the conduct.

- (d) Certification. Every bid submitted to and contract executed by the State shall contain a certification by the contractor that the contractor is not barred from being awarded a contract or subcontract under this Section. A contractor who makes a false statement, material to the certification, commits a Class 3 felony.

2. The bidder certifies that it is not barred from being awarded a contract under Section 50.5.

#### **C. Educational Loan**

1. Section 3 of the Educational Loan Default Act provides:

§ 3. No State agency shall contract with an individual for goods or services if that individual is in default, as defined in Section 2 of this Act, on an educational loan. Any contract used by any State agency shall include a statement certifying that the individual is not in default on an educational loan as provided in this Section.

2. The bidder, if an individual as opposed to a corporation, partnership or other form of business organization, certifies that the bidder is not in default on an educational loan as provided in Section 3 of the Act.

#### **D. Bid-Rigging/Bid Rotating**

1. Section 33E-11 of the Criminal Code of 1961 provides:

§ 33E-11. (a) Every bid submitted to and public contract executed pursuant to such bid by the State or a unit of local government shall contain a certification by the prime contractor that the prime contractor is not barred from contracting with any unit of State or local government as a result of a violation of either Section 33E-3 or 33E-4 of this Article. The State and units of local government shall provide the appropriate forms for such certification.

## RETURN WITH BID

(b) A contractor who makes a false statement, material to the certification, commits a Class 3 felony.

A violation of Section 33E-3 would be represented by a conviction of the crime of bid-rigging which, in addition to Class 3 felony sentencing, provides that any person convicted of this offense or any similar offense of any state or the United States which contains the same elements as this offense shall be barred for 5 years from the date of conviction from contracting with any unit of State or local government. No corporation shall be barred from contracting with any unit of State or local government as a result of a conviction under this Section of any employee or agent of such corporation if the employee so convicted is no longer employed by the corporation and: (1) it has been finally adjudicated not guilty or (2) if it demonstrates to the governmental entity with which it seeks to contract and that entity finds that the commission of the offense was neither authorized, requested, commanded, nor performed by a director, officer or a high managerial agent in behalf of the corporation.

A violation of Section 33E-4 would be represented by a conviction of the crime of bid-rotating which, in addition to Class 2 felony sentencing, provides that any person convicted of this offense or any similar offense of any state or the United States which contains the same elements as this offense shall be permanently barred from contracting with any unit of State or local government. No corporation shall be barred from contracting with any unit of State or local government as a result of a conviction under this Section of any employee or agent of such corporation if the employee so convicted is no longer employed by the corporation and: (1) it has been finally adjudicated not guilty or (2) if it demonstrates to the governmental entity with which it seeks to contract and that entity finds that the commission of the offense was neither authorized, requested, commanded, nor performed by a director, officer or a high managerial agent in behalf of the corporation.

2. The bidder certifies that it is not barred from contracting with the Department by reason of a violation of either Section 33E-3 or Section 33E-4.

### **E. International Anti-Boycott**

1. Section 5 of the International Anti-Boycott Certification Act provides:

§ 5. State contracts. Every contract entered into by the State of Illinois for the manufacture, furnishing, or purchasing of supplies, material, or equipment or for the furnishing of work, labor, or services, in an amount exceeding the threshold for small purchases according to the purchasing laws of this State or \$10,000.00, whichever is less, shall contain certification, as a material condition of the contract, by which the contractor agrees that neither the contractor nor any substantially-owned affiliated company is participating or shall participate in an international boycott in violation of the provisions of the U.S. Export Administration Act of 1979 or the regulations of the U.S. Department of Commerce promulgated under that Act.

2. The bidder makes the certification set forth in Section 5 of the Act.

### **F. Drug Free Workplace**

1. The Illinois "Drug Free Workplace Act" applies to this contract and it is necessary to comply with the provisions of the "Act" if the contractor is a corporation, partnership, or other entity (including a sole proprietorship) which has 25 or more employees.

2. The bidder certifies that if awarded a contract in excess of \$5,000 it will provide a drug free workplace by:

(a) Publishing a statement notifying employees that the unlawful manufacture, distribution, dispensation, possession or use of a controlled substance, including cannabis, is prohibited in the contractor's workplace; specifying the actions that will be taken against employees for violations of such prohibition; and notifying the employee that, as a condition of employment on such contract, the employee shall abide by the terms of the statement, and notify the employer of any criminal drug statute conviction for a violation occurring in the workplace no later than five (5) days after such conviction.

(b) Establishing a drug free awareness program to inform employees about the dangers of drug abuse in the workplace; the contractor's policy of maintaining a drug free workplace; any available drug counseling, rehabilitation, and employee assistance programs; and the penalties that may be imposed upon employees for drug violations.

(c) Providing a copy of the statement required by subparagraph (1) to each employee engaged in the performance of the contract and to post the statement in a prominent place in the workplace.

(d) Notifying the Department within ten (10) days after receiving notice from an employee or otherwise receiving actual notice of the conviction of an employee for a violation of any criminal drug statute occurring in the workplace.

(e) Imposing or requiring, within 30 days after receiving notice from an employee of a conviction or actual notice of such a conviction, an appropriate personnel action, up to and including termination, or the satisfactory participation in a drug abuse assistance or rehabilitation program approved by a federal, state or local health, law enforcement or other appropriate agency.

(f) Assisting employees in selecting a course of action in the event drug counseling, treatment, and rehabilitation is required and indicating that a trained referral team is in place.

(g) Making a good faith effort to continue to maintain a drug free workplace through implementation of the actions and efforts stated in this certification.

#### **G. Debt Delinquency**

1. The Illinois Procurement Code provides:

Section 50-11 and 50-12. Debt Delinquency.

The contractor or bidder certifies that it, or any affiliate, is not barred from being awarded a contract under 30 ILCS 500. Section 50-11 prohibits a person from entering into a contract with a State agency if it knows or should know that it, or any affiliate, is delinquent in the payment of any debt to the State as defined by the Debt Collection Board. Section 50-12 prohibits a person from entering into a contract with a State agency if it, or any affiliate, has failed to collect and remit Illinois Use Tax on all sales of tangible personal property into the State of Illinois in accordance with the provisions of the Illinois Use Tax Act. The contractor further acknowledges that the contracting State agency may declare the contract void if this certification is false or if the contractor, or any affiliate, is determined to be delinquent in the payment of any debt to the State during the term of the contract.

#### **H. Sarbanes-Oxley Act of 2002**

1. The Illinois Procurement Code provides:

Section 50-60(c).

The contractor certifies in accordance with 30 ILCS 500/50-10.5 that no officer, director, partner or other managerial agent of the contracting business has been convicted of a felony under the Sarbanes-Oxley Act of 2002 or a Class 3 or Class 2 felony under the Illinois Securities Law of 1953 for a period of five years prior to the date of the bid or contract. The contractor acknowledges that the contracting agency shall declare the contract void if this certification is false.

#### **I. ADDENDA**

The contractor or bidder certifies that all relevant addenda have been incorporated in to this contract. Failure to do so may cause the bid to be declared unacceptable.

#### **J. Section 42 of the Environmental Protection Act**

The contractor certifies in accordance with 30 ILCS 500/50-12 that the bidder or contractor is not barred from being awarded a contract under this Section which prohibits the bidding on or entering into contracts with the State of Illinois or a State agency by a person or business found by a court or the Pollution Control Board to have committed a willful or knowing violation of Section 42 of the Environmental Protection Act for a period of five years from the date of the order. The contractor acknowledges that the contracting agency may declare the contract void if this certification is false.

#### **K. Apprenticeship and Training Certification (Does not apply to federal aid projects)**

In accordance with the provisions of Section 30-22 (6) of the Illinois Procurement Code, the bidder certifies that it is a participant, either as an individual or as part of a group program, in the approved apprenticeship and training programs applicable to each type of work or craft that the bidder will perform with its own forces. The bidder further certifies for work that will be performed by subcontract that each of its subcontractors submitted for approval either (a) is, at the time of such bid, participating in an approved, applicable apprenticeship and training program; or (b) will, prior to commencement of performance of work pursuant to this contract, begin participation in an approved apprenticeship and training program applicable to the work of the subcontract. The Department, at any time before or after award, may require the production of a copy of each applicable Certificate of Registration issued by the United States Department of Labor evidencing such participation by the contractor and each of its subcontractors. Unless otherwise directed in writing by the Department, applicable apprenticeship and training programs are those that have been approved and registered with the United States Department of Labor. The bidder shall list in the space below, the official name of the program sponsor holding the Certificate of Registration for all of the types of work or crafts in which the bidder is a participant and that will be performed with the bidder's forces. Types of work or craft work that will be subcontracted may be indicated as to be subcontracted.

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The requirements of this certification and disclosure are a material part of the contract, and the contractor shall require this certification provision to be included in all approved subcontracts. In order to fulfill this requirement, it shall not be necessary that an applicable program sponsor be currently taking or that it will take applications for apprenticeship, training or employment during the performance of the work of this contract.

#### IV. DISCLOSURES

**A.** The disclosures hereinafter made by the bidder are each a material representation of fact upon which reliance is placed should the Department enter into the contract with the bidder. The Department may terminate the contract if it is later determined that the bidder rendered a false or erroneous disclosure, and the surety providing the performance bond shall be responsible for completion of the contract.

#### **B. Financial Interests and Conflicts of Interest**

1. Section 50-35 of the Illinois Procurement Code provides that all bids of more than \$10,000 shall be accompanied by disclosure of the financial interests of the bidder. This disclosed information for the successful bidder, will be maintained as public information subject to release by request pursuant to the Freedom of Information Act.

The financial interests to be disclosed shall include ownership or distributive income share that is in excess of 5%, or an amount greater than 60% of the annual salary of the Governor, of the bidding entity or its parent entity, whichever is less, unless the contractor or bidder is a publicly traded entity subject to Federal 10K reporting, in which case it may submit its 10K disclosure in place of the prescribed disclosure. If a bidder is a privately held entity that is exempt from Federal 10K reporting, but has more than 400 shareholders, it may submit the information that Federal 10K companies are required to report, and list the names of any person or entity holding any ownership share that is in excess of 5%. The disclosure shall include the names, addresses, and dollar or proportionate share of ownership of each person making the disclosure, their instrument of ownership or beneficial relationship, and notice of any potential conflict of interest resulting from the current ownership or beneficial interest of each person making the disclosure having any of the relationships identified in Section 50-35 and on the disclosure form.

In addition, all disclosures shall indicate any other current or pending contracts, proposals, leases, or other ongoing procurement relationships the bidding entity has with any other unit of state government and shall clearly identify the unit and the contract, proposal, lease, or other relationship.

2. **Disclosure Forms.** Disclosure Form A is attached for use concerning the individuals meeting the above ownership or distributive share requirements. Subject individuals should be covered each by one form. In addition, a second form (Disclosure Form B) provides for the disclosure of current or pending procurement relationships with other (non-IDOT) state agencies. **The forms must be included with each bid or incorporated by reference.**

#### **C. Disclosure Form Instructions**

##### **Form A: For bidders that have previously submitted the information requested in Form A**

The Department has retained the Form A disclosures submitted by all bidders responding to these requirements for the April 24, 1998 or any subsequent letting conducted by the Department. The bidder has the option of submitting the information again or the bidder may sign the following certification statement indicating that the information previously submitted by the bidder is, as of the date of signature, current and accurate. The Certification must be signed and dated by a person who is authorized to execute contracts for the bidding company. Before signing this certification, the bidder should carefully review its prior submissions to ensure the Certification is correct. If the Bidder signs the Certification, the Bidder should proceed to Form B instructions.

#### **CERTIFICATION STATEMENT**

**I have determined that the Form A disclosure information previously submitted is current and accurate, and all forms are hereby incorporated by reference in this bid. Any necessary additional forms or amendments to previously submitted forms are attached to this bid.**

\_\_\_\_\_  
(Bidding Company)

\_\_\_\_\_  
Name of Authorized Representative (type or print)

\_\_\_\_\_  
Title of Authorized Representative (type or print)

\_\_\_\_\_  
Signature of Authorized Representative

\_\_\_\_\_  
Date

**Form A: For bidders who have NOT previously submitted the information requested in Form A**

If the bidder is a publicly traded entity subject to Federal 10K reporting, the 10K Report may be submitted to meet the requirements of Form A. If a bidder is a privately held entity that is exempt from Federal 10K reporting, but has more than 400 shareholders, it may submit the information that Federal 10K companies are required to report, and list the names of any person or entity holding any ownership share that is in excess of 5%. If a bidder is not subject to Federal 10K reporting, the bidder must determine if any individuals are required by law to complete a financial disclosure form. To do this, the bidder should answer each of the following questions. A "YES" answer indicates Form A must be completed. If the answer to each of the following questions is "NO", then the NOT APPLICABLE STATEMENT on the second page of Form A must be signed and dated by a person that is authorized to execute contracts for the bidding company. Note: These questions are for assistance only and are not required to be completed.

1. Does anyone in your organization have a direct or beneficial ownership share of greater than 5% of the bidding entity or parent entity? YES \_\_\_ NO \_\_\_
2. Does anyone in your organization have a direct or beneficial ownership share of less than 5%, but which has a value greater than \$90,420.00? YES \_\_\_ NO \_\_\_
3. Does anyone in your organization receive more than \$90,420.00 of the bidding entity's or parent entity's distributive income? (Note: Distributive income is, for these purposes, any type of distribution of profits. An annual salary is not distributive income.) YES \_\_\_ NO \_\_\_
4. Does anyone in your organization receive greater than 5% of the bidding entity's or parent entity's total distributive income, but which is less than \$90,420.00? YES \_\_\_ NO \_\_\_  
(Note: Only one set of forms needs to be completed per person per bid even if a specific individual would require a yes answer to more than one question.)

A "YES" answer to any of these questions requires the completion of Form A. The bidder must determine each individual in the bidding entity or the bidding entity's parent company that would cause the questions to be answered "Yes". Each form must be signed and dated by a person that is authorized to execute contracts for your organization. **Photocopied or stamped signatures are not acceptable.** The person signing can be, but does not have to be, the person for which the form is being completed. The bidder is responsible for the accuracy of any information provided.

If the answer to each of the above questions is "NO", then the NOT APPLICABLE STATEMENT on page 2 of Form A must be signed and dated by a person that is authorized to execute contracts for your company.

**Form B: Identifying Other Contracts & Procurement Related Information** Disclosure Form B must be completed for each bid submitted by the bidding entity. It must be signed by an individual who is authorized to execute contracts for the bidding entity. Note: Signing the NOT APPLICABLE STATEMENT on Form A does not allow the bidder to ignore Form B. Form B must be completed, signed and dated or the bidder may be considered nonresponsive and the bid will not be accepted.

The Bidder shall identify, by checking Yes or No on Form B, whether it has any pending contracts (including leases), bids, proposals, or other ongoing procurement relationship with any other (non-IDOT) State of Illinois agency. If "No" is checked, the bidder only needs to complete the signature box on the bottom of Form B. If "Yes" is checked, the bidder must do one of the following:

Option I: If the bidder did not submit an Affidavit of Availability to obtain authorization to bid, the bidder must list all non-IDOT State of Illinois agency pending contracts, leases, bids, proposals, and other ongoing procurement relationships. These items may be listed on Form B or on an attached sheet(s). Do not include IDOT contracts. Contracts with cities, counties, villages, etc. are not considered State of Illinois agency contracts and are not to be included. Contracts with other State of Illinois agencies such as the Department of Natural Resources or the Capital Development Board must be included. Bidders who submit Affidavits of Availability are suggested to use Option II.

Option II: If the bidder is required and has submitted an Affidavit of Availability in order to obtain authorization to bid, the bidder may write or type "See Affidavit of Availability" which indicates that the Affidavit of Availability is incorporated by reference and includes all non-IDOT State of Illinois agency pending contracts, leases, bids, proposals, and other ongoing procurement relationships. For any contracts that are not covered by the Affidavit of Availability, the bidder must identify them on Form B or on an attached sheet(s). These might be such things as leases.

**D. Bidders Submitting More Than One Bid**

Bidders submitting multiple bids may submit one set of forms consisting of all required Form A disclosures and one Form B for use with all bids. Please indicate in the space provided below the bid item that contains the original disclosure forms and the bid items which incorporate the forms by reference.

- The bid submitted for letting item \_\_\_\_\_ contains the Form A disclosures or Certification Statement and the Form B disclosures. The following letting items incorporate the said forms by reference:

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RETURN WITH BID/OFFER

ILLINOIS DEPARTMENT  
OF TRANSPORTATION

Form A  
Financial Information &  
Potential Conflicts of Interest  
Disclosure

Contractor Name		
Legal Address		
City, State, Zip		
Telephone Number	Email Address	Fax Number (if available)

Disclosure of the information contained in this Form is required by the Section 50-35 of the Illinois Procurement Code (30 ILCS 500). Vendors desiring to enter into a contract with the State of Illinois must disclose the financial information and potential conflict of interest information as specified in this Disclosure Form. This information shall become part of the publicly available contract file. This Form A must be completed for bids in excess of \$10,000, and for all open-ended contracts. **A publicly traded company may submit a 10K disclosure (or equivalent if applicable) in satisfaction of the requirements set forth in Form A. See Disclosure Form Instructions.**

**DISCLOSURE OF FINANCIAL INFORMATION**

**1. Disclosure of Financial Information.** The individual named below has an interest in the BIDDER (or its parent) in terms of ownership or distributive income share in excess of 5%, or an interest which has a value of more than \$90,420.00 (60% of the Governor's salary as of 7/1/01). **(Make copies of this form as necessary and attach a separate Disclosure Form A for each individual meeting these requirements)**

**FOR INDIVIDUAL (type or print information)**

NAME: \_\_\_\_\_

ADDRESS \_\_\_\_\_

Type of ownership/distributable income share:

stock \_\_\_\_\_ sole proprietorship \_\_\_\_\_ Partnership \_\_\_\_\_ other: (explain on separate sheet):  
% or \$ value of ownership/distributable income share: \_\_\_\_\_

**2. Disclosure of Potential Conflicts of Interest.** Check "Yes" or "No" to indicate which, if any, of the following potential conflict of interest relationships apply. If the answer to any question is "Yes", please attach additional pages and describe.

(a) State employment, currently or in the previous 3 years, including contractual employment of services.

Yes \_\_\_ No \_\_\_

If your answer is yes, please answer each of the following questions.

- Are you currently an officer or employee of either the Capitol Development Board or the Illinois Toll Highway Authority? Yes \_\_\_ No \_\_\_
- Are you currently appointed to or employed by any agency of the State of Illinois? If you are currently appointed to or employed by any agency of the State of Illinois, and your annual salary exceeds \$90,420.00, (60% of the Governor's salary as of 7/1/01) provide the name the State agency for which you are employed and your annual salary. \_\_\_\_\_

## RETURN WITH BID/OFFER

3. If you are currently appointed to or employed by any agency of the State of Illinois, and your annual salary exceeds \$90,420.00, (60% of the Governor's salary as of 7/1/01) are you entitled to receive (i) more than 7 1/2% of the total distributable income of your firm, partnership, association or corporation, or (ii) an amount in excess of the salary of the Governor? Yes \_\_\_ No \_\_\_
4. If you are currently appointed to or employed by any agency of the State of Illinois, and your annual salary exceeds \$90,420.00, (60% of the Governor's salary as of 7/1/01) are you and your spouse or minor children entitled to receive (i) more than 15% in aggregate of the total distributable income of your firm, partnership, association or corporation, or (ii) an amount in excess of 2 times the salary of the Governor? Yes \_\_\_ No \_\_\_

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(b) State employment of spouse, father, mother, son, or daughter, including contractual employment for services in the previous 2 years.

Yes \_\_\_ No \_\_\_

If your answer is yes, please answer each of the following questions.

1. Is your spouse or any minor children currently an officer or employee of the Capitol Development Board or the Illinois Toll Highway Authority? Yes \_\_\_ No \_\_\_
2. Is your spouse or any minor children currently appointed to or employed by any agency of the State of Illinois? If your spouse or minor children is/are currently appointed to or employed by any agency of the State of Illinois, and his/her annual salary exceeds \$90,420.00, (60% of the Governor's salary as of 7/1/01) provide the name of the spouse and/or minor children, the name of the State agency for which he/she is employed and his/her annual salary. \_\_\_\_\_
3. If your spouse or any minor children is/are currently appointed to or employed by any agency of the State of Illinois, and his/her annual salary exceeds \$90,420.00, (60% of the salary of the Governor as of 7/1/01) are you entitled to receive (i) more than 7 1/2% of the total distributable income of your firm, partnership, association or corporation, or (ii) an amount in excess of the salary of the Governor? Yes \_\_\_ No \_\_\_
4. If your spouse or any minor children are currently appointed to or employed by any agency of the State of Illinois, and his/her annual salary exceeds \$90,420.00, (60% of the Governor's salary as of 7/1/01) are you and your spouse or any minor children entitled to receive (i) more than 15% in the aggregate of the total distributable income from your firm, partnership, association or corporation, or (ii) an amount in excess of 2 times the salary of the Governor? Yes \_\_\_ No \_\_\_

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(c) Elective status; the holding of elective office of the State of Illinois, the government of the United States, any unit of local government authorized by the Constitution of the State of Illinois or the statutes of the State of Illinois currently or in the previous 3 years. Yes \_\_\_ No \_\_\_

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(d) Relationship to anyone holding elective office currently or in the previous 2 years; spouse, father, mother, son, or daughter. Yes \_\_\_ No \_\_\_

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(e) Appointive office; the holding of any appointive government office of the State of Illinois, the United State of America, or any unit of local government authorized by the Constitution of the State of Illinois or the statutes of the State of Illinois, which office entitles the holder to compensation in excess of the expenses incurred in the discharge of that office currently or in the previous 3 years. Yes \_\_\_ No \_\_\_

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(f) Relationship to anyone holding appointive office currently or in the previous 2 years; spouse, father, mother, son, or daughter. Yes \_\_\_ No \_\_\_

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(g) Employment, currently or in the previous 3 years, as or by any registered lobbyist of the State government. Yes \_\_\_ No \_\_\_

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## RETURN WITH BID/OFFER

(h) Relationship to anyone who is or was a registered lobbyist in the previous 2 years; spouse, father, mother, son, or daughter. Yes \_\_\_ No \_\_\_

(i) Compensated employment, currently or in the previous 3 years, by any registered election or reelection committee registered with the Secretary of State or any county clerk of the State of Illinois, or any political action committee registered with either the Secretary of State or the Federal Board of Elections. Yes \_\_\_ No \_\_\_

(j) Relationship to anyone; spouse, father, mother, son, or daughter; who was a compensated employee in the last 2 years by any registered election or re-election committee registered with the Secretary of State or any county clerk of the State of Illinois, or any political action committee registered with either the Secretary of State or the Federal Board of Elections. Yes \_\_\_ No \_\_\_

### APPLICABLE STATEMENT

**This Disclosure Form A is submitted on behalf of the INDIVIDUAL named on previous page.**

Completed by: \_\_\_\_\_  
Name of Authorized Representative (type or print)

Completed by: \_\_\_\_\_  
Title of Authorized Representative (type or print)

Completed by: \_\_\_\_\_  
Signature of Individual or Authorized Representative Date

### NOT APPLICABLE STATEMENT

**I have determined that no individuals associated with this organization meet the criteria that would require the completion of this Form A.**

**This Disclosure Form A is submitted on behalf of the CONTRACTOR listed on the previous page.**

\_\_\_\_\_  
Name of Authorized Representative (type or print)

\_\_\_\_\_  
Title of Authorized Representative (type or print)

\_\_\_\_\_  
Signature of Authorized Representative Date

RETURN WITH BID/OFFER

ILLINOIS DEPARTMENT  
OF TRANSPORTATION

Form B  
Other Contracts &  
Procurement Related Information  
Disclosure

Contractor Name		
Legal Address		
City, State, Zip		
Telephone Number	Email Address	Fax Number (if available)

Disclosure of the information contained in this Form is required by the Section 50-35 of the Illinois Procurement Act (30 ILCS 500). This information shall become part of the publicly available contract file. This Form B must be completed for bids in excess of \$10,000, and for all open-ended contracts.

**DISCLOSURE OF OTHER CONTRACTS AND PROCUREMENT RELATED INFORMATION**

**1. Identifying Other Contracts & Procurement Related Information.** The BIDDER shall identify whether it has any pending contracts (including leases), bids, proposals, or other ongoing procurement relationship with any other State of Illinois agency: Yes \_\_\_ No \_\_\_

If “No” is checked, the bidder only needs to complete the signature box on the bottom of this page.

**2. If “Yes” is checked.** Identify each such relationship by showing State of Illinois agency name and other descriptive information such as bid or project number (attach additional pages as necessary). SEE DISCLOSURE FORM INSTRUCTIONS:

**THE FOLLOWING STATEMENT MUST BE SIGNED**

_____ Name of Authorized Representative (type or print)	
_____ Title of Authorized Representative (type or print)	
_____ Signature of Authorized Representative	_____ Date

## **RETURN WITH BID**

### **SPECIAL NOTICE TO CONTRACTORS**

The following requirements of the Illinois Department of Human Rights' Rules and Regulations are applicable to bidders on all construction contracts advertised by the Illinois Department of Transportation:

#### **CONSTRUCTION EMPLOYEE UTILIZATION PROJECTION**

- (a) All bidders on construction contracts shall complete and submit, along with and as part of their bids, a Bidder's Employee Utilization Form (Form BC-1256) setting forth a projection and breakdown of the total workforce intended to be hired and/or allocated to such contract work by the bidder including a projection of minority and female employee utilization in all job classifications on the contract project.
- (b) The Department of Transportation shall review the Employee Utilization Form, and workforce projections contained therein, of the contract awardee to determine if such projections reflect an underutilization of minority persons and/or women in any job classification in accordance with the Equal Employment Opportunity Clause and Section 7.2 of the Illinois Department of Human Rights' Rules and Regulations for Public Contracts adopted as amended on September 17, 1980. If it is determined that the contract awardee's projections reflect an underutilization of minority persons and/or women in any job classification, it shall be advised in writing of the manner in which it is underutilizing and such awardee shall be considered to be in breach of the contract unless, prior to commencement of work on the contract project, it submits revised satisfactory projections or an acceptable written affirmative action plan to correct such underutilization including a specific timetable geared to the completion stages of the contract.
- (c) The Department of Transportation shall provide to the Department of Human Rights a copy of the contract awardee's Employee Utilization Form, a copy of any required written affirmative action plan, and any written correspondence related thereto. The Department of Human Rights may review and revise any action taken by the Department of Transportation with respect to these requirements.



## RETURN WITH BID

**Contract No. 83664  
DUPAGE County  
Section 96-00099-00-BR (Naperville)  
Project BROS-D1(487)  
Route MAIN STREET  
District 1 Construction Funds**

### PART II. WORKFORCE PROJECTION - continued

- B. Included in "Total Employees" under Table A is the total number of **new hires** that would be employed in the event the undersigned bidder is awarded this contract.

The undersigned bidder projects that: (number) \_\_\_\_\_ new hires would be recruited from the area in which the contract project is located; and/or (number) \_\_\_\_\_ new hires would be recruited from the area in which the bidder's principal office or base of operation is located.

- C. Included in "Total Employees" under Table A is a projection of numbers of persons to be employed directly by the undersigned bidder as well as a projection of numbers of persons to be employed by subcontractors.

The undersigned bidder estimates that (number) \_\_\_\_\_ persons will be directly employed by the prime contractor and that (number) \_\_\_\_\_ persons will be employed by subcontractors.

### PART III. AFFIRMATIVE ACTION PLAN

- A. The undersigned bidder understands and agrees that in the event the foregoing minority and female employee utilization projection included under **PART II** is determined to be an underutilization of minority persons or women in any job category, and in the event that the undersigned bidder is awarded this contract, he/she will, prior to commencement of work, develop and submit a written Affirmative Action Plan including a specific timetable (geared to the completion stages of the contract) whereby deficiencies in minority and/or female employee utilization are corrected. Such Affirmative Action Plan will be subject to approval by the contracting agency and the **Department of Human Rights**.
- B. The undersigned bidder understands and agrees that the minority and female employee utilization projection submitted herein, and the goals and timetable included under an Affirmative Action Plan if required, are deemed to be part of the contract specifications.

Company \_\_\_\_\_  
\_\_\_\_\_

Telephone Number \_\_\_\_\_

Address \_\_\_\_\_  
\_\_\_\_\_

#### NOTICE REGARDING SIGNATURE

The Bidder's signature on the Proposal Signature Sheet will constitute the signing of this form. The following signature block needs to be completed only if revisions are required.

Signature: \_\_\_\_\_ Title: \_\_\_\_\_ Date: \_\_\_\_\_

Instructions: All tables must include subcontractor personnel in addition to prime contractor personnel.

Table A - Include both the number of employees that would be hired to perform the contract work and the total number currently employed (Table B) that will be allocated to contract work, and include all apprentices and on-the-job trainees. The "Total Employees" column should include all employees including all minorities, apprentices and on-the-job trainees to be employed on the contract work.

Table B - Include all employees currently employed that will be allocated to the contract work including any apprentices and on-the-job trainees currently employed.

Table C - Indicate the racial breakdown of the total apprentices and on-the-job trainees shown in Table A.

BC-1256-Pg. 2 (Rev. 3/98)

## RETURN WITH BID

### **ADDITIONAL FEDERAL REQUIREMENTS**

In addition to the Required Contract Provisions for Federal-Aid Construction Contracts (FHWA 1273), all bidders make the following certifications.

- A. By the execution of this proposal, the signing bidder certifies that the bidding entity has not, either directly or indirectly, entered into any agreement, participated in any collusion, or otherwise taken any action, in restraint of free competitive bidding in connection with the submitted bid. This statement made by the undersigned bidder is true and correct under penalty of perjury under the laws of the United States.
- B. CERTIFICATION, EQUAL EMPLOYMENT OPPORTUNITY:
1. Have you participated in any previous contracts or subcontracts subject to the equal opportunity clause. YES \_\_\_\_\_ NO \_\_\_\_\_
  2. If answer to #1 is yes, have you filed with the Joint Reporting Committee, the Director of OFCC, any Federal agency, or the former President's Committee on Equal Employment Opportunity, all reports due under the applicable filing requirements of those organizations?  
YES \_\_\_\_\_ NO \_\_\_\_\_



**RETURN WITH BID**

**Contract No. 83664  
DUPAGE County  
Section 96-00099-00-BR (Naperville)  
Project BROS-D1(487)  
Route MAIN STREET  
District 1 Construction Funds**

PROPOSAL SIGNATURE SHEET

The undersigned bidder hereby makes and submits this bid on the subject Proposal, thereby assuring the Department that all requirements of the Invitation for Bids and rules of the Department have been met, that there is no misunderstanding of the requirements of paragraph 3 of this Proposal, and that the contract will be executed in accordance with the rules of the Department if an award is made on this bid.

(IF AN INDIVIDUAL)

Firm Name \_\_\_\_\_

Signature of Owner \_\_\_\_\_

Business Address \_\_\_\_\_

\_\_\_\_\_

(IF A CO-PARTNERSHIP)

Firm Name \_\_\_\_\_

By \_\_\_\_\_

Business Address \_\_\_\_\_

\_\_\_\_\_

Name and Address of All Members of the Firm: \_\_\_\_\_

\_\_\_\_\_

(IF A CORPORATION)

Corporate Name \_\_\_\_\_

By \_\_\_\_\_

Signature of Authorized Representative \_\_\_\_\_

Typed or printed name and title of Authorized Representative \_\_\_\_\_

Attest \_\_\_\_\_

Signature \_\_\_\_\_

(IF A JOINT VENTURE, USE THIS SECTION FOR THE MANAGING PARTY AND THE SECOND PARTY SHOULD SIGN BELOW)

Business Address \_\_\_\_\_

(IF A JOINT VENTURE)

Corporate Name \_\_\_\_\_

By \_\_\_\_\_

Signature of Authorized Representative \_\_\_\_\_

Typed or printed name and title of Authorized Representative \_\_\_\_\_

Attest \_\_\_\_\_

Signature \_\_\_\_\_

Business Address \_\_\_\_\_

If more than two parties are in the joint venture, please attach an additional signature sheet.

RETURN WITH BID



Illinois Department  
of Transportation

Division of Highways  
Proposal Bid Bond  
(Effective November 1, 1992)

Item No. \_\_\_\_\_  
Letting Date \_\_\_\_\_

KNOW ALL MEN BY THESE PRESENTS, That We \_\_\_\_\_

as PRINCIPAL, and \_\_\_\_\_

\_\_\_\_\_ as SURETY, are held jointly, severally and firmly bound unto the STATE OF ILLINOIS in the penal sum of 5 percent of the total bid price, or for the amount specified in Article 102.09 of the "Standard Specifications for Road and Bridge Construction" in effect on the date of invitation for bids, whichever is the lesser sum, well and truly to be paid unto said STATE OF ILLINOIS, for the payment of which we bind ourselves, our heirs, executors, administrators, successors and assigns.

THE CONDITION OF THE FOREGOING OBLIGATION IS SUCH, That Whereas, the PRINCIPAL has submitted a bid proposal to the STATE OF ILLINOIS, acting through the Department of Transportation, for the improvement designated by the Transportation Bulletin Item Number and Letting Date indicated above.

NOW, THEREFORE, if the Department shall accept the bid proposal of the PRINCIPAL; and if the PRINCIPAL shall, within the time and as specified in the bidding and contract documents, submit a DBE Utilization Plan that is accepted and approved by the Department; and if, after award by the Department, the PRINCIPAL shall enter into a contract in accordance with the terms of the bidding and contract documents including evidence of the required insurance coverages and providing such bond as specified with good and sufficient surety for the faithful performance of such contract and for the prompt payment of labor and material furnished in the prosecution thereof; or if, in the event of the failure of the PRINCIPAL to make the required DBE submission or to enter into such contract and to give the specified bond, the PRINCIPAL pays to the Department the difference not to exceed the penalty hereof between the amount specified in the bid proposal and such larger amount for which the Department may contract with another party to perform the work covered by said bid proposal, then this obligation shall be null and void, otherwise, it shall remain in full force and effect.

IN THE EVENT the Department determines the PRINCIPAL has failed to comply with any requirement as set forth in the preceding paragraph, then Surety shall pay the penal sum to the Department within fifteen (15) days of written demand therefor. If Surety does not make full payment within such period of time, the Department may bring an action to collect the amount owed. Surety is liable to the Department for all its expenses, including attorney's fees, incurred in any litigation in which it prevails either in whole or in part.

In TESTIMONY WHEREOF, the said PRINCIPAL and the said SURETY have caused this instrument to be signed by their respective officers this \_\_\_\_\_ day of \_\_\_\_\_ A.D., \_\_\_\_\_.

PRINCIPAL

SURETY

(Company Name)

(Company Name)

By: \_\_\_\_\_  
(Signature & Title)

By: \_\_\_\_\_  
(Signature of Attorney-in-Fact)

Notary Certification for Principal and Surety

STATE OF ILLINOIS,  
COUNTY OF \_\_\_\_\_

I, \_\_\_\_\_, a Notary Public in and for said County, do hereby certify that  
\_\_\_\_\_ and \_\_\_\_\_

(Insert names of individuals signing on behalf of PRINCIPAL & SURETY)

who are each personally known to me to be the same persons whose names are subscribed to the foregoing instrument on behalf of PRINCIPAL and SURETY, appeared before me this day in person and acknowledged respectively, that they signed and delivered said instrument as their free and voluntary act for the uses and purposes therein set forth.

Given under my hand and notarial seal this \_\_\_\_\_ day of \_\_\_\_\_, A.D. \_\_\_\_\_.

My commission expires \_\_\_\_\_  
Notary Public

In lieu of completing the above section of the Proposal Bid Form, the Principal may file an Electronic Bid Bond. By signing below the Principal is ensuring the identified electronic bid bond has been executed and the Principal and Surety are firmly bound unto the State of Illinois under the conditions of the bid bond as shown above.

Electronic Bid Bond ID#

Company/Bidder Name

Signature and Title

# PROPOSAL ENVELOPE



## PROPOSALS

for construction work advertised for bids by the  
Illinois Department of Transportation

Item No.	Item No.	Item No.

Submitted By:

Name:
Address:
Phone No.

Bidders should use an IDOT proposal envelope or affix this form to the front of a 10" x 13" envelope for the submittal of bids. If proposals are mailed, they should be enclosed in a second or outer envelope addressed to:

Engineer of Design and Environment - Room 323  
Illinois Department of Transportation  
2300 South Dirksen Parkway  
Springfield, Illinois 62764

### **NOTICE**

**Individual bids, including Bid Bond and/or supplemental information if required, should be securely stapled.**

# CONTRACTOR OFFICE COPY OF CONTRACT SPECIFICATIONS

## NOTICE

None of the following material needs to be returned with the bid package unless the special provisions require documentation and/or other information to be submitted.

**Contract No. 83664  
DUPAGE County  
Section 96-00099-00-BR (Naperville)  
Project BROS-D1(487)  
Route MAIN STREET  
District 1 Construction Funds**



**Illinois Department of Transportation**



## Illinois Department of Transportation

## NOTICE TO BIDDERS

1. **TIME AND PLACE OF OPENING BIDS.** Sealed proposals for the improvement described herein will be received by the Department of Transportation at the Harry R. Hanley Building, 2300 South Dirksen Parkway, in Springfield, Illinois until 10:00 o'clock a.m., November 5, 2004. All bids will be gathered, sorted, publicly opened and read in the auditorium at the Department of Transportation's Harry R. Hanley Building shortly after the 10:00 a.m. cut off time.
2. **DESCRIPTION OF WORK.** The proposed improvement is identified and advertised for bids in the Invitation for Bids as:

**Contract No. 83664  
DUPAGE County  
Section 96-00099-00-BR (Naperville)  
Project BROS-D1(487)  
Route MAIN STREET  
District 1 Construction Funds**

**Construction consists of the removal and reconstruction of the Main Street Bridge over the west branch of the DuPage River between Walter Street and Chicago Avenue in Naperville.**

3. **INSTRUCTIONS TO BIDDERS.** (a) This Notice, the invitation for bids, proposal and letter of award shall, together with all other documents in accordance with Article 101.09 of the Standard Specifications for Road and Bridge Construction, become part of the contract. Bidders are cautioned to read and examine carefully all documents, to make all required inspections, and to inquire or seek explanation of the same prior to submission of a bid.  
  
(b) State law, and, if the work is to be paid wholly or in part with Federal-aid funds, Federal law requires the bidder to make various certifications as a part of the proposal and contract. By execution and submission of the proposal, the bidder makes the certification contained therein. A false or fraudulent certification shall, in addition to all other remedies provided by law, be a breach of contract and may result in termination of the contract.
4. **AWARD CRITERIA AND REJECTION OF BIDS.** This contract will be awarded to the lowest responsive and responsible bidder considering conformity with the terms and conditions established by the Department in the rules, Invitation for Bids and contract documents. The issuance of plans and proposal forms for bidding based upon a prequalification rating shall not be the sole determinant of responsibility. The Department reserves the right to determine responsibility at the time of award, to reject any or all proposals, to readvertise the proposed improvement, and to waive technicalities.

By Order of the  
Illinois Department of Transportation

Timothy W. Martin, Secretary

BD 351 (Rev. 01/2003)

# **SPECIAL PROVISIONS**

## **Main Street over the West Branch of the DuPage River Water Street to Chicago Avenue**

**City of Naperville  
DuPage County**

Section No. 96-00099-00-BR  
C-91-139-96

Contract No. 83664

July 9, 2004

Prepared by:



*A Tyco Infrastructure Services Company*

CHECKSHEET  
FOR  
SUPPLEMENTAL SPECIFICATIONS  
AND RECURRING SPECIAL PROVISIONS

Adopted January 1, 2004 (Rev. 7/1/04)

This sheet contains a listing of the ERRATA, and SUPPLEMENTAL SPECIFICATIONS, frequently used RECURRING SPECIAL PROVISIONS and RECURRING LOCAL ROADS AND STREETS SPECIAL PROVISIONS.

ERRATA Standard Specifications for Road and Bridge Construction (Adopted 1-1-02) ( Revised 1-1-04)

Page vi - xviii

SUPPLEMENTAL SPECIFICATIONS

<u>Std. Spec. Sec.</u>		<u>Page No.</u>
101	Definition of Terms .....	1
105	Control of Work.....	2
205	Embankment .....	3
251	Mulch .....	4
440	Removal of Existing Pavement and Appurtenances .....	5
442	Pavement Patching .....	6
449	Removal and Replacement of Preformed Elastomeric Compression Joint Seal.....	7
501	Removal of Existing Structures .....	8
503	Concrete Structures.....	9
505	Steel Structures .....	10
506	Cleaning and Painting Metal Surfaces .....	13
508	Reinforcement Bars.....	14
512	Piling.....	15
540	Box Culverts .....	16
669	Removal and Disposal of Regulated Substances .....	18
671	Mobilization.....	19
702	Work Zone Traffic Control Devices.....	20
1003	Fine Aggregates .....	21
1004	Coarse Aggregate .....	22
1020	Portland Cement Concrete .....	25
1021	Concrete Admixtures .....	32
1022	Concrete Curing Materials .....	33
1024	Nonshrink Grout .....	35
1056	Preformed Flexible Gaskets and Mastic Joint Sealer for Sewer and Culvert pipe .....	37
1060	Waterproofing Materials .....	38
1069	Pole and Tower .....	39
1070	Foundation and Breakaway Devices .....	40
1077	Post and Foundation .....	42
1080	Fabric Materials.....	43
1083	Elastomeric Bearings.....	46
1094	Overhead Sign Structures .....	47
1103	Portland Cement Concrete Equipment.....	48

The following RECURRING SPECIAL PROVISIONS and RECURRING LOCAL ROADS AND STREETS SPECIAL PROVISIONS indicated by an "X" are applicable to this contract and are included by reference:

RECURRING SPECIAL PROVISIONS

<u>CHECK SHEET #</u>		<u>PAGE NO.</u>
1	<input checked="" type="checkbox"/> State Required Contract Provision All Federal-aid Construction Contracts (Eff. 2-1-69) (Rev. 10-1-83) .....	49
2	<input checked="" type="checkbox"/> Subletting of Contracts (Federal Aid Contracts) (Eff. 1-1-88) (Rev. 5-1-93).....	51
3	<input checked="" type="checkbox"/> EEO (Eff. 7-21-78) (Rev. 11-18-80).....	52
4	<input type="checkbox"/> Specific Equal Employment Opportunity Responsibilities Non Federal-aid Contracts (Eff. 3-20-69) (Rev. 1-1-94).....	63
5	<input type="checkbox"/> Required Provisions - State Contracts (Eff. 4-1-65) (Rev. 4-1-93) .....	69
6	<input type="checkbox"/> Reserved .....	74
7	<input checked="" type="checkbox"/> Asphalt Quantities and Cost Reviews (Eff. 7-1-88) .....	75
8	<input type="checkbox"/> National Pollutant Discharge Elimination System Permit (Eff 7-1-94) (Rev. 1-1-03).....	76
9	<input checked="" type="checkbox"/> Haul Road Stream Crossings, Other Temporary Stream Crossings, and In-Stream Work Pads (Eff. 1-2-92) (Rev. 1-1-98) .....	77
10	<input type="checkbox"/> Construction Layout Stakes Except for Structure" (Eff. 1-1-99) (Rev. 1-1-02) .....	78
11	<input checked="" type="checkbox"/> Construction Layout Stakes (Eff. 5-1-93) (Rev. 1-1-02) .....	81
12	<input type="checkbox"/> Use of Geotextile Fabric for Railroad Crossing (Eff. 1-1-95) (Rev. 1-1-97) .....	84
13	<input type="checkbox"/> Asphaltic Emulsion Slurry Seal and Fibrated Asphaltic Emulsion Slurry Seal (Eff. 8-1-89) (Rev. 2-1-97) .....	86
14	<input type="checkbox"/> Bituminous Surface Treatment Half-Smart (Eff. 7-1-93) (Rev. 1-1-97) .....	92

15	<input checked="" type="checkbox"/>	Quality Control/Quality Assurance of Bituminous Concrete Mixtures (Eff. 1-1-00) (Rev. 1-1-04)	98
16	<input type="checkbox"/>	Subsealing of Concrete Pavements (Eff. 11-1-84) (Rev. 2-1-95)	117
17	<input type="checkbox"/>	Bituminous Surface Removal (Cold Milling) (Eff. 11-1-87) (Rev. 10-15-97)	121
18	<input type="checkbox"/>	Resurfacing of Milled Surfaces (Eff. 10-1-95)	123
19	<input type="checkbox"/>	PCC Partial Depth Bituminous Patching (Eff. 1-1-98)	124
20	<input type="checkbox"/>	Patching with Bituminous Overlay Removal (Eff. 10-1-95) (Rev. 7-1-99)	126
21	<input type="checkbox"/>	Reserved	128
22	<input checked="" type="checkbox"/>	Protective Shield System (Eff. 4-1-95) (Rev. 1-1-03)	129
23	<input type="checkbox"/>	Polymer Concrete (Eff. 8-1-95) (Rev. 1-1-04)	131
24	<input checked="" type="checkbox"/>	Controlled Low Strength Material (CLSM) (Eff. 1-1-90) (Rev. 1-1-00)	133
25	<input checked="" type="checkbox"/>	Pipe Underdrains (Eff. 9-9-87) (Rev. 1-1-98)	138
26	<input type="checkbox"/>	Guardrail and Barrier Wall Delineation (Eff. 12-15-93) (Rev. 1-1-97)	139
27	<input type="checkbox"/>	Bicycle Racks (Eff. 4-1-94) (Rev. 1-1-97)	144
28	<input type="checkbox"/>	Give em a Brake Sign (Eff. 8-1-89) (Rev. 8-1-91)	146
29	<input checked="" type="checkbox"/>	Portable Changeable Message Signs (Rev. 2/1/96)	147
30	<input type="checkbox"/>	Reserved	148
31	<input type="checkbox"/>	Night Time Inspection of Roadway Lighting (Eff. 5-1-96)	149
32	<input type="checkbox"/>	Reserved	150
33	<input type="checkbox"/>	English Substitution of Metric Bolts (Eff. 7-1-96)	151
34	<input type="checkbox"/>	English Substitution of Metric Reinforcement Bars (Eff. 4-1-96) (Rev. 1-1-03)	152
35	<input type="checkbox"/>	Polymer Modified Emulsified Asphalt (Eff. 1-1-04)	154
36	<input type="checkbox"/>	Corrosion Inhibitor (Eff. 3-1-90) (Rev. 7-1-99)	156
37	<input type="checkbox"/>	QC of Concrete Mixtures at the Plant - Single A (Eff. 8-1-00) (Rev. 1-1-04)	157
38	<input type="checkbox"/>	QC of Concrete Mixtures at the Plant - Double A (Eff. 8-1-00) (Rev. 1-1-04)	163
39	<input checked="" type="checkbox"/>	Quality Control/Quality Assurance of Concrete Mixtures (Eff. 4-1-92) (Rev. 1-1-04)	171
40	<input type="checkbox"/>	Traffic Barrier Terminal Type 1, Special (Eff. 8-1-94) (Rev. 1-1-03)	185
41	<input type="checkbox"/>	Reserved	186
42	<input checked="" type="checkbox"/>	Segregation Control of Bituminous Concrete (Eff. 7-15-97)	187
43	<input type="checkbox"/>	Reserved	190

#### RECURRING LOCAL ROADS AND STREETS SPECIAL PROVISIONS

<u>CHECK SHEET #</u>	<u>PAGE NO.</u>
LRS 1 <input checked="" type="checkbox"/> Cooperation With Utilities (Eff. 1-1-99) (Rev. 1-1-02)	192
LRS 2 <input type="checkbox"/> Furnished Excavation (Eff. 1-1-99) (Rev. 1-1-02)	194
LRS 3 <input checked="" type="checkbox"/> Construction Zone Traffic Control (Eff. 1-1-99)	195
LRS 4 <input checked="" type="checkbox"/> Flaggers in Work Zones (Eff. 1-1-99)	196
LRS 5 <input type="checkbox"/> Reserved	197
LRS 6 <input type="checkbox"/> Bidding Requirements and Conditions for Contract Proposals (Eff. 1-1-02)	198
LRS 7 <input type="checkbox"/> Bidding Requirements and Conditions for Material Proposals (Eff. 1-1-02)	204
LRS 8 <input type="checkbox"/> Failure to Complete the Work on Time (Eff. 1-1-99)	210
LRS 9 <input type="checkbox"/> Bituminous Surface Treatments (Eff. 1-1-99)	211
LRS 10 <input type="checkbox"/> Reflective Sheeting Type C (Eff. 1-1-99) (Rev. 1-1-02)	212
LRS 11 <input type="checkbox"/> Employment Practices (Eff. 1-1-99)	213
LRS 12 <input type="checkbox"/> Wages of Employees on Public Works (Eff. 1-1-99)	215
LRS 13 <input type="checkbox"/> Selection of Labor (Eff. 1-1-99)	216



## TABLE OF CONTENTS

LOCATION OF PROJECT .....	6
DESCRIPTION OF PROJECT .....	6
MAINTENANCE OF ROADWAYS .....	7
NOISE LIMITATIONS .....	7
STORMWATER MANAGEMENT PERMIT APPLICATION NO. 04-25-0012/T12192... , .....	8
STATUS OF UTILITIES TO BE ADJUSTED .....	11
START OF WORK.....	11
INCENTIVE/DISINCENTIVE.....	11
VANDALISM.....	13
TREE REMOVAL.....	13
RECLAIMED ASPHALT PAVEMENT FOR NON-POROUS EMBANKMENT AND BACKFILL..	13
RECLAIMED ASPHALT PAVEMENT (RAP) FOR TEMPORARY ACCESS ENTRANCES	
AND/OR AGGREGATE SHOULDERS, TYPE B.....	14
APPROACH SLAB REMOVAL .....	14
BRIDGE APPROACH PAVEMENT (SPECIAL) .....	14
TRENCH AND BACKFILL IN PAVEMENT.....	15
BACKFILLING STORM SEWER UNDER ROADWAY .....	16
STORM SEWER ADJACENT TO OR CROSSING WATER MAIN.....	16
TEMPORARY DRAINAGE.....	16
TEMPORARY ACCESS ROAD (SPECIAL).....	16
PEDESTRIAN PROTECTION.....	17
TEMPORARY CHAIN LINK FENCE, 8'.....	18
CHAIN LINK FENCE REMOVAL .....	18
STORM SEWER REMOVAL .....	19
STORM SEWERS, DUCTILE IRON PIPE .....	19
CLEANING EXISTING DRAINAGE STRUCTURES .....	20
TRAFFIC CONTROL PLAN .....	20
TRAFFIC CONTROL AND PROTECTION FOR TEMPORARY DETOUR.....	21
WORK ZONE TRAFFIC CONTROL (LUMP SUM PAYMENT) .....	21
TRAFFIC CONTROL FOR WORK ZONE AREAS .....	21
TEMPORARY INFORMATION SIGNING .....	22
CHANGEABLE MESSAGE SIGNS.....	23
RUSTICATION FINISH.....	23

PEDESTRIAN RAILING.....	25
PIPE UNDERDRAIN FOR STRUCTURES, 6" .....	25
BRIDGE EXPANSION JOINT SYSTEM.....	27
ELASTOMERIC BEARING PADS (SPECIAL) .....	29
LOW FLOW WALK (SPECIAL).....	29
FURNISHING, INSTALLING AND STRESSING POST-TENSIONING TENDONS .....	31
CONCRETE SLOPEWALL (SPECIAL).....	51
TRAFFIC BARRIER RAIL.....	53
REMOVE AND REPLACE EXISTING STONE WALL .....	53
SEGMENTAL CONCRETE BLOCK WALL .....	54
DUCTILE IRON WATER MAIN, 6".....	57
DUCTILE IRON WATER MAIN, 12".....	57
WATER SERVICE LINE ¾" .....	62
<del>FIRE HYDRANTS TO BE REMOVED.....</del>	<del>62</del>
FIRE HYDRANT WITH AUXILIARY VALVE AND VALVE BOX .....	63
GATE VALVE AND VAULT, 8" .....	65
GATE VALVE AND VAULT, 12".....	65
LINE STOP, 6".....	66
LINE STOP, 8".....	66
VALVE VAULTS TO BE REMOVED .....	66
ANTI-GRAFFITI COATING .....	67
BENCH.....	69
BRICK PAVERS .....	69
PCC UNDERLAYMENT, 6".....	73
PCC HEADER BANDING .....	73
REMOVE AND RESET BRICK SIDEWALK.....	77
CONCRETE CURB (SPECIAL) .....	78
ENTRY COLUMN .....	78
STONE FINISHES FOR COLUMN .....	80

PLANTER.....	84
TOPSOIL (PLANTING MIXTURE).....	87
TREES, SHRUBS, GRASSES, PLUGS AND GROUNDCOVERS.....	88
STAMPED ASPHALT CROSSWALK.....	90
TURBIDITY CURTAIN.....	93
GENERAL ELECTRICAL REQUIREMENTS.....	95
GROUND ROD.....	99
UNDERGROUND RACEWAYS.....	100
TRENCH AND BACKFILL FOR ELECTRICAL WORK.....	100
YELLOW WARNING TAPE OVER STREET LIGHT CABLE.....	101
WIRE AND CABLE.....	101
MAINTAIN EXISTING SHEPHERDS LIGHTING DURING CONSTRUCTION.....	103
ELECTRIC SERVICE INSTALLATION.....	103
ELECTRIC UTILITY SERVICE CONNECTION.....	104
JUNCTION BOX EMBEDDED IN STRUCTURE.....	104
HANDHOLE (SPECIAL).....	104
LIGHTING STANDARD, SODIUM VAPOR, ACORN, 100 WATT.....	105
POLE WIRE, 1/C #10 XLP/USE-2.....	106
<del>LIGHTING CABLE FUSE KITS.....</del>	<del>107</del>
FLOOD LIGHT, GROUND MOUNTED, 100 WATTS, METAL HALIDE.....	108
FLOOD LIGHT, GROUND MOUNTED, 175 WATTS, METAL HALIDE.....	108
LIGHTING CONTROLLER, SPECIAL.....	109
RELOCATE EXISTING LIGHTING UNIT.....	114
REMOVE BRIDGE SERVICE, WOOD POLE, MESSENGER WIRES.....	114
PHOTOCELL CONTROL WIRE.....	114
6-WAY PVC DUCT BANK, 6 X 6" DIA.....	115
TYPE 'G' MANHOLE INSTALLATION.....	117
VIDEO TAPE.....	118
CONCRETE ENCASEMENT.....	119
TRENCH BACKFILL, CA-6.....	120
CONTROLLED LOW - STRENGTH MATERIALS (CLSM).....	122
ROD AND MANDREL.....	125
GROUND ROD SYSTEM INSTALLATION.....	126
PULLING ROPE AND DETECTABLE MULE TAPE.....	126
COUNTERPOISE, PAVED.....	127

Main Street over the  
West Branch of the DuPage River  
Section: 96-00099-00-BR  
County: DuPage

HAND DIGGING, 0 FT TO 5 FEET IN PAVEMENT .....	128
HAND DIGGING, 5 FT TO 20 FEET IN PAVEMENT .....	128
HAND DIGGING, 0 FT TO 5 FEET IN UNPAVED AREAS.....	128
HAND DIGGING, 5 FT TO 20 FEET IN UNPAVED AREAS.....	128
MACHINE AIDED DIGGING, 0 FT TO 5 FEET IN PAVEMENT .....	129
MACHINE AIDED DIGGING, 5 FT TO 20 FEET IN PAVEMENT .....	129
MACHINE AIDED DIGGING, 0 FT TO 5 FEET IN UNPAVED AREAS.....	129
MACHINE AIDED DIGGING, 5 FT TO 20 FEET IN UNPAVED AREAS.....	129
ADJUSTING MANHOLE, FRAME, COVER AND RINGS.....	130
CONNECTING TO EXISTING MANHOLES BY CORE DRILLING .....	130
ELECTRIC DUCT BANK MATERIALS SUPPLIED BY THE CITY OF NAPERVILLE.....	133
NOTIFICATION OF DEMOLITION AND RENOVATION (FORM IL 532 1296 APC 430) .....	133

---

APPENDIX A:	CITY OF NAPERVILLE SECTION 500 WATER DISTRIBUTION SYSTEM CONSTRUCTION STANDARDS	136 - 158
-------------	--	-----------

APPENDIX B:	LANDSCAPING	159 - 174
-------------	-------------	-----------

## INDEX LOCAL ROADS AND STREETS SPECIAL PROVISIONS

<u>LR#</u>	<u>TITLE</u>	<u>PAGE</u>
SD 16	"Slab Movement Detection Device" (Eff. 11-1-84).....	
SD 17	"Required Cold Milled Surface Texture" (Eff. 11-1-87).....	
107	"Nationwide Permit No. 14" (Eff. 2-1-04). Developed by the Bureau of Local Roads and Streets..... to outline the necessary requirements to comply with No. 14 permits.	
108	"Combination Bids (Eff. 1-1-94)(Rev. 1-1-02). Developed by the Bureau of Local Roads..... and Streets to allow the revision of working days and calendar days. Revised to incorporate applicable portions of deleted Sections 102 & 103	
109	"Contract Claims" (Eff. 1-1-02) (Rev. 5-1-02). Developed by the Bureau of Local Roads..... and Streets to assist local agencies in handling contract claims.	
212	"Shaping Roadway" (Eff. 8-1-69) (Rev. 1-1-02).....	
302	"Soil-Lime Mixture (Eff. 8-31-95)(Rev. 1-1-02). Developed by the Bureau of Local Roads ..... and Streets to modify Section 302.	
355-1	"Asphalt Stabilized Base Course, Road Mix or Traveling Plant Mix" (Eff. 10-1-73)(Rev. 1-1-02).....	
355-2	"Asphalt Stabilized Base Course, Plant Mix" (Eff. 2-20-63)(Rev. 1-1-02)	
355-3	"Bituminous Aggregate Mixture Base Course" (6-27-66)(Rev. 1-1-02). Developed by the..... Bureau of Materials and Physical Research and the Bureau of Local Roads and Streets to construct a stabilized base course with paving grade asphalt.	
400	"Penetrating Emulsified Prime" (Eff. 4-1-84)(Rev. 1-1-02).....	
402	"Salt Stabilized Surface Course" (Eff. 2-20-63)(Rev. 1-1-02).....	
403-1	"Penetrating Emulsified Asphalt" (Eff. 1-1-94)(Rev. 1-1-02). Developed for bituminous..... surface treatments on roads that require flexibility and penetration due to low traffic volume.	
403-2	Bituminous Hot Mix Sand Seal Coat" (Eff. 8-1-69)(Rev. 1-1-02).....	
420	"PCC Pavement (Special)" (Eff. 5-12-64)(Rev. 1-1-02). Developed by the Bureau..... of Local Roads and Streets to allow local agencies to construct quality PCC pavements for low volume roads.	
430	"Paving Brick and Concrete Pave Pavements and Sidewalks" (Eff 1-1-04) Developed by the Bureau of Local Roads & Streets and the Bureau of Materials & Physical Research to provide statewide requirements for paving brick and concrete paver pavements and sidewalks.	
442	"Bituminous Patching Mixtures for Maintenance Use" (Eff 1-1-04). Developed by the Bureau of Local Roads & Streets to reference approved bituminous patching mixtures.	
451	"Crack Filling Bituminous Pavement with Fiber-Asphalt" (Eff. 10-1-91)(Rev. 1-1-02).....	
503-1	"Furnishing Class SI Concrete" (Eff. 10-1-73)(Rev. 1-1-02).....	
503-2	"Furnishing Class SI Concrete (Short Load)" (Eff. 1-1-89) (Rev. 1-1-02). Developed ..... by the Bureau of Local Roads and Streets to allow a load charge to be added when short loads are expected during the contract.	
542	"Pipe Culverts, Type (Furnished)" (Eff. 9 -1-64) (Rev. 1-1-02).....	
663	"Calcium Chloride Applied" (Eff. 6-1-58) (Rev. 1-1-02).....	
701	"Flagger Certification" (Eff. 1-1-93) (Rev. 1-1-02).....	
702	"Construction and Maintenance Signs" (Eff 1-1-04) Developed by the Bureau of Local Roads & Streets to require florescent orange sheeting and minimum sign size of 48" X 48" on construction and maintenance signs.	
1004	"Coarse Aggregate for Bituminous Surface Treatment" (Eff. 1-1-02). Developed by the..... Bureau of Materials & Physical Research, the Bureau of Local Roads & Streets, and Local Agencies to provide a coarser mix when aggregate producers have adjusted the CA-16 gradation according to the Aggregate Gradation Control System (AGCS) to a finer mix for Hot-Mix Asphalt.	
1013	"Rock Salt (Sodium Chloride)" (Eff. 8-1-69) (Rev. 1-1-02).....	

## INDEX INTERIM SPECIAL PROVISIONS

<u>ISP#</u>	<u>TITLE</u>	<u>PAGE</u>
ISP #	Title (Effective Date). Description	
04-01a X	"Disadvantage Business Enterprise Participation" (Eff. 11/7/03)(Rev. 6/1/04). .... Developed by the Bureau of Small Business Enterprises for contracts with DBE goals.	175-181
04-02 X	"Training Special Provisions" (Eff. 10/15/75).....	182-183
04-03 X	"Payment to Subcontractors" (Eff. 6/1/00).(Rev 9/1/03) Developed by the Bureau of Construction to ensure that contractors pay subcontractors for satisfactory performance of their subcontracts within a specific number of days after receipt of each payment made to the contractor, and to require the prompt return of retainage withheld from subcontractors.	184

# INDEX INTERIM SPECIAL PROVISIONS (CONT'D)

<u>ISP#</u>	<u>TITLE</u>	<u>PAGE</u>
04-04a	"Additional Bidder Responsibility Evaluation" (Eff 1/1/04) (Rev 4/1/04) Developed by the Office of Chief Council.	
04-05	X "Partial Payments" (Eff 9/17/03). Developed by the Bureau of Construction to eliminate retainage from our contracts. The special provision for Material Allowances has been incorporated for convenience".	185
04-06	"Authority of Railroad Engineer" (Eff 7/1/04).	
04-07	"Railroad Protective Liability Insurance" (Eff. 12/1/86)(Rev. 5/1/88).....	
04-08	X "Traffic Control Deficiency Deduction" (Eff. 4/1/92)(Rev. 1/1/03). Developed to ensure.....	186
	the prompt response to deficiencies to specified traffic control and protection.	
04-09	X "Weight Control Deficiency Deduction" (Eff. 4/1/01) (Rev. 8/1/02). Developed by the.....	187
	Bureau of Construction, Office of Chief Counsel, and the Office of Quality to adjust pay based on random truck weighings.	
04-10	X "Erosion and Sediment Control Deficiency Deduction" (Eff. 8/1/01) (Rev. 11/1/01).....	188
	Developed by the Bureau of Design and Environment and the Bureau of Construction to correct the deduction percentage and to further clarify a "deficiency".	
04-11	X "Inlet Filters" (Eff 8/1/03). Developed by the Bureau of Materials and Physical Research and the Illinois Development Council to provide statewide requirements for inlet filters.	189-190
04-12	Reserved.....	
04-13	X "Subgrade Preparation" (Eff. 11/01/02). Developed by the Subgrade Stability Manual.....	191
	Committee to reduce the maximum allowable rut depth in subgrades.	
04-14	Reserved.....	
04-15	"Notched Wedge Longitudinal Joint" (Eff 7/1/04)	
04-16	X "Superpave Bituminous Concrete Mixtures" (Eff. 1/1/00)(Rev. 1/1/04).....	192-197
	Developed by the Bureau of Materials and Physical Research.	
04-17	X "RAP for Use in Bituminous Concrete Mixtures" (Eff. 1/1/00)(Rev. 4/1/02).....	198-200
	Revised by the Bureau of Materials and Physical Research to allow RAP from routes or airfields under federal and local agency jurisdiction, improving the consistency of conglomerate RAP, and allowing RAP from BAM to be worked back into stabilized subbase and BAM shoulders.	
04-18	Reserved.....	
04-19	"Superpave Bituminous Concrete Mixtures (Low ESAL)" (Eff. 1/1/01)(Rev. 1/1/03). .....	
	Revised by the Bureau of Materials and Physical Research to include all guidelines for Low ESAL superpave bituminous concrete mixtures.	
04-20	X "Bituminous Concrete Surface Course" (Eff. 4/1/01).(Rev 4/1/03) Developed by the Bureau of Materials and Physical Research to allow total tonnage to be calculated. The requirement for skid-resistant aggregate in bituminous concrete surfaces mandates the use of aggregates with varying specific gravities. Surface course mixtures may weigh from 105 to 127 pounds per square yard per inch of thickness. The designer does not know what aggregate sources the contractor will select and therefore cannot accurately predict the total tonnage on the job.	201
04-21	Reserved.....	
04-22	"Shoulder Resurfacing" (Eff. 2/1/00)(Rev. 8/1/02). Developed by the Bureau of Design.....	
	and Environment to minimize motorist costs and inconveniences.	
04-23	Reserved.....	
04-24	X "Coarse Aggregate for Trench Backfill, Backfill, and Bedding" (Eff. 4/1/01)(Rev. 11/1/03).....	202-207
	Developed by the Bureau of Construction to allow the use of coarse aggregate as bedding, backfill and trench backfill for pipe culverts and storm sewers. It also allows the use of controlled low strength material for backfilling the trenches at the Contractor's option and expense.	
04-25	Reserved.....	
04-26	Reserved.....	
04-27	Reserved.....	
04-28	X "Expansion Joints" (Eff 8/1/03). Developed by the Bureau of Materials & Physical Research to require plastic expansion caps in lieu of metal pinch stops on the ends of dowel bars in expansion joints.	208
04-29	Reserved.....	
04-30	X "Curb Ramps for Sidewalk" (Eff 1/1/04) Developed by the Bureau of Design and Environment and the Bureau of Materials and Physical Research to comply with Americans with Disabilities Act, Accessibility Guidelines (ADAAG) for detectable warnings on curb ramps.	209-210
04-31	Reserved.....	

# INDEX INTERIM SPECIAL PROVISIONS (CONT'D)

<u>ISP#</u>		<u>TITLE</u>	<u>PAGE</u>
04-32		Reserved.....	
04-33		Reserved.....	
04-34		"Corrugated Metal Pipe Culverts" (Eff 8/1/03). Developed by the Bureau of Materials & Physical Research and the Illinois Highway Development Council to allow an alternate method of joining corrugated metal pipe.	
04-35		"Portland Cement Concrete Patching" (Eff. 1/1/01)(Rev. 1/1/04). Developed by..... the Bureau of Materials and Physical Research to provide additional rapid set patching mixtures, clarify the use of admixtures, and change the opening strength requirements.	
04-36		"Calcium Chloride Accelerator for Portland Cement Concrete Patching" (Eff. 1/1/01). .... Developed by the Bureau of Materials and Physical Research to allow the use of a calcium chloride accelerator for patching.	
04-37		"Asbestos Bearing Pad Removal" (Eff. 11/01/03). Developed by the Bureau of Design and Environment.	
04-38		"Precast, Prestressed Concrete Members" (Eff. 4/1/04). Developed by the Bureau..... of Bridges and Structures.	
04-39	X	"Asbestos Waterproofing Membrane or Asbestos Bituminous Concrete Surface Removal"..... (Eff. 6/1/89)(Rev. 6/30/94)	211
04-40	X	"Precast Concrete" (Eff. 7/1/99)(Rev. 1/1/02). Developed by the Bureau of Materials..... and Physical Research to allow the use of slag/modified portland cement.	212
04-41		Reserved.....	
04-42	X	"Adjusting Frames and Grates" (Eff. 8/1/01)(Rev. 11/1/01). Developed by the..... Bureau of Materials and Physical Research and the Illinois Highway Development Council to allow the use of plastic and structural steel adjusting rings.	213-214
04-43		"Driving Guardrail Posts" (Eff. 4/1/98). Developed by the Bureau of Design and ..... Environment to give the Contractor the option to drive steel posts through bituminous shoulders when the foreslopes are 1:3 or flatter.	
04-44		"Remove and Re-Erect Steel Plate Beam Guardrail and Traffic Barrier Terminals" (Eff. 1/1/01)..... Developed by the Bureau of Design and Environment to require the replacement of steel block-outs with wood block-outs during the removal and re-erection of steel plate beam guardrail and traffic barrier terminals.	
04-45		"Impact Attenuators" (Eff. 11/1/03) Developed by the Bureau of Design and Environment to combine "Sand Module Impact Attenuators" and "Traffic Barrier Terminal Type 3, Special" into one specification. All of these devices are now called Impact Attenuators and are categorized by their operational/ redirective properties. The revised approach is also reflected in BDE Procedure Memorandum 34-03, Impact Attenuators and the Department's Approved List of Impact Attenuators.	
04-46		"Impact Attenuators, Temporary" (Eff. 11/1/03) Developed by the Bureau of Design and Environment to combine "Sand Module Impact Attenuators" and "Traffic Barrier Terminal Type 3, Special" into one specification. All of these devices are now called Impact Attenuators and are categorized by their operational/redirective properties. This revised approach is also reflected in BDE Procedure Memorandum 34-03, Impact Attenuators and the Department's Approved List of Impact Attenuators.	
04-47	X	"Flagger Vests" (Eff. 4/1/03). Developed by the Bureau of Operations to bring department ..... specifications for flagger vests into compliance with the American National Standards Institute specification ANSI/ISEA 107-1999 for high visibility safety apparel.	215
04-48		"Temporary Modular Glare Screen System" (Eff. 1/1/00). Developed by the Bureau of Operations.....	
04-49		"Railroad, Full-actuated Controller and Cabinet" (Eff. 4/1/04). Developed by the Bureau of Operations.... in cooperation with the Illinois Commerce Commission.	
04-50		Reserved.....	
04-51		"Public Convenience and Safety" (Eff. 1/1/00). Developed by the Bureau of Design and ..... Environment in an effort to minimize motorist costs and inconvenience.	
04-52		"Transient Voltage Surge Suppression" (Eff. 8/1/03). Developed by the Bureau of Operations and the Bureau of Design and Environment to provide statewide requirements for transient voltage surge suppression of traffic signal controller cabinets.	
04-53		"Epoxy Pavement Markings" (Eff. 1/1/01)(Rev. 8/1/03). Developed by the Bureau of ..... Operations to revise the glass beads applied to epoxy pavement markings to improve reflectivity and durability of the pavement markings.	
04-54		"Accessible Pedestrian Signals (APS)" (Eff. 4/1/03). Developed by the Bureau of Operations and..... The Bureau of Design to provide statewide requirements for accessible pedestrian signals (APS).	

# INDEX INTERIM SPECIAL PROVISIONS (CONT'D)

ISP#		TITLE	PAGE
04-55	X	"Epoxy Coatings for Steel Reinforcement" (Eff. 4/1/03). Developed by the Bureau of Materials and..... Physical Research to require all producer's of epoxy coated reinforcing steel to be certified by the Concrete Reinforcing Steel Institute's (CRSI) Epoxy Plant Certification Program.	216
04-56	X	"Stone for Erosion Protection, Sediment Control and Rockfill" (Eff 1/1/04) Developed by the Bureau of Materials & Physical Research to update the quality and gradation requirements of stone used for erosion protection, sediment control, and rockfill.	217-218
04-57	X	"Hand Vibrator" (Eff 11-1-03). Developed by the Bureau of Materials & Physical Research in response to a recommendation by the FHWA Substructure Quality Improvement Team to prevent damage to the epoxy coating on reinforcement bars.	219
04-58	X	"Working Days" (Eff. 1/1/02). Developed by the Bureau of Design and Environment to ..... replace the working days paragraph deleted from BDE's proposal forms.	220
04-59	X	"Bituminous Base Course/ Widening Superpave" (Eff. 4/1/02) (Rev. 1/1/03). ..... Developed by the Bureau of Materials and Physical Research to specify the design of superpave mixtures that are comparable to bituminous base course.	221-225
04-60		"Stabilized Subbase and Bituminous Shoulders Superpave" (Eff. 4/1/02) (Rev. 1/1/03). ..... Developed by the Bureau of Materials and Physical Research to specify the design of a superpave mixture that is comparable to a bituminous aggregate mixture (BAM). It also establishes a pay item for BITUMINOUS SHOULDER SUPERPAVE.	
04-61	X	"Organic Zinc-Rich Paint System" (Eff. 11/1/01) (Rev 8/1/03). Developed by the Bureau of Materials... and Physical Research in response to the recommendations of the 1999 FHWA/IDOT Bridge Coatings Process Review.	226-229
04-62		"Light Emitting Diode (LED) Signal Head" (Eff. 4/1/02) (Rev 8/1/03). Developed by the Bureau of Operations to provide Statewide requirements for LED signal heads.	
04-63		"Furnished Excavation" (Eff. 8/1/02) (Rev 8/1/03). Developed by the Bureau of Design & Environment to clarify the method of measurement for furnished excavation.	
04-64		"Surface Testing of Interstate Pavements" (Eff. 4/1/02) (Rev 8/1/03). Developed by the Bureau of Materials & Physical Research as part of the Illinois Smoothness Initiative (ISI).	
04-65	X	"Freeze-Thaw Rating" (Eff. 11/1/02). Developed by the Bureau of Materials & ..... Physical Research to restrict D-cracking susceptible aggregate for pavement appurtenances.	230
04-66	X	"Traffic Structures" (Eff. 11/1/02). Developed by the Bureau of Bridges & Structures..... to comply with new AASHTO specifications.	231
04-67		"Sealing Abandoned Water Wells" (Eff. 11/1/02). Developed by the Bureau of Design and Environment...	
04-68	X	"Temporary Erosion Control" (Eff. 11/1/02). Developed by the Illinois Highway Development..... Council to add another material option for temporary ditch checks.	232
04-69		"Precast Block Revetment Mat" (Eff. 1/1/03). Developed by the Bureau of Materials & ..... Physical Research and the Bureau of Design & Environment to provide material requirements for precast block revetment mat and disregard conflicting information in the Standard Specifications.	
04-70		"Articulated Block Revetment Mat" (Eff. 1/1/03). Developed by the Bureau of Materials..... & Physical Research and the Bureau of Design & Environment to provide material requirements for articulated block revetment mat and disregard conflicting information in the Standard Specifications.	
04-71	X	"Controlled Aggregate Mixing System" (Eff. 11/1/02). Developed by the Bureau of ..... Materials & Physical Research.	233
04-72		"Chair Supports" (Eff. 11/1/02) (Rev. 11/2/02). Developed by the Bureau of Materials & Physical ..... Research to eliminate the use of plastic chair support for continuously reinforced pavements.	
04-73	X	"Epoxy Coating on Reinforcement" (Eff. 4/1/97) (Rev. 1/1/03). Developed to eliminate..... epoxy coatings on pavement reinforcement bars and thus reduce construction costs.	234
04-74		"Multilane Pavement Patching" (Eff. 11/1/02). Developed to address work stoppages and ..... material shortages that have been occurring with pavement patching.	
04-75		"Bridge Deck Construction" (Eff. 4/1/02) (Rev. 1/1/04). Developed by the Bureau of ..... Materials & Physical Research in response to the recommendations of the 1998 FHWA/IDOT Bridge Deck Construction Process Review.	
04-76	X	"Preformed Recycled Rubber Joint Filler" (Eff. 11/1/02). Developed by the Illinois ..... Highway Development Council to add another material option for preformed expansion joint fillers.	235
04-77		"Insertion Lining of Pipe Culverts" (Eff. 11/1/02). (Rev 8/1/03) Developed by the Bureau of... Materials & Physical Research as the result of discussions by the Implementation Sections of the Central Bureaus and Districts.	
04-78		"Underdrain Operations" (11/1/02). Developed to minimize motorists' inconvenience.....	



# INDEX INTERIM SPECIAL PROVISIONS (CONT'D)

<u>ISP#</u>		<u>TITLE</u>	<u>PAGE</u>
04-79		"Shoulder Inlets with Curb" (Eff. 8/1/02). Developed by the Bureau of Design & ..... Environment to include the portland cement concrete slab in the cost of the inlet box.	
04-80		"Traffic Barrier Terminals" (Eff. 1/1/03). Developed by the Bureau of Design & ..... Environment to meet the requirements of the National Cooperative Highway Research Program (NCHRP) Report 350.	
04-81		"Shoulder Rumble Strips" (Eff. 1/1/03). Developed by the Bureau of Design & Environment.....	
04-82		<b>Rescinded.</b>	
04-83	X	"Work Zone Traffic Control Devices" (Eff. 1/1/03) (Rev 4/2/04). ....	236
04-84	X	Fluorescent Orange Sheeting on Drums (Rev 1/1/03) .....	237
04-85	X	Vertical Barricades (Eff 11/1/02). ....	238
04-86	X	"Temporary Concrete Barrier" (Eff. 10/1/02) (Rev 11/1/03). Developed by the Bureau of Design & ... Environment to meet the National Highway Research Program (NCHRP) Report 350 requirements and to introduce the IDOT F shape barrier design.	239-240
04-87		"Lime Gradation Requirements" (Eff. 11/1/02). Developed by the Bureau of Materials & Physical..... Research to revise the current lime gradation requirements.	
04-88	X	"Concrete Admixtures" (Eff. 1/1/03) (Rev 1/1/04). Developed by the Bureau of Materials & Physical research. ....	241-244
04-89	X	"Portland Cement Concrete" (Eff. 11/1/02). Developed by the Bureau of Materials & Physical..... Research and the PCC Technical Group. ....	245
04-90	X	"Curing and Protection of Concrete Construction" (Eff. 1/1/04). Developed to correct and clarify the curing/ protection requirements for concrete. ....	246-252
04-91		"Concrete Barrier" (Eff. 1/1/04). Developed by the Bureau of Design and Environment to redesign IDOT's permanent concrete barrier to the F shape. ....	
04-92		"Temporary Portable Bridge Traffic Signals" (Eff. 8/1/03). Developed by the Bureau of Operations to provide statewide requirements for temporary portable (i.e. trailer mounted) bridge traffic signals.	
04-93		"Raised Reflective Pavement Markers (Bridge) " (Eff. 8/1/03). Developed by the Bureau of Operations to provide statewide requirements for raised reflective pavement markers used on bridge decks.	
04-94	X	"Personal Protective Equipment " (Eff 7/1/04)	253
04-95a		"Work Zone Public Information Signs" (Eff 4/2/04) (Rev 4/15/04).....	
04-96a		"Work Zone Speed Limit Signs" (Eff 4/2/04) (Rev 4/15/04).....	
04-97	X	"Work Zone Traffic Control" (Eff 4/2/04) .....	254
04-98a		"Steel Cost Adjustment" (Eff 4/2/04) (Rev 7/1/04).....	

# GUIDE BRIDGE SPECIAL PROVISION INDEX/CHECK SHEET

Effective: January 1, 2004

File Name	X	Title	Effective	Revised	Page No.
GBSP1		Formed Concrete Repair	Oct 10, 1995	Aug 21, 2002	
GBSP2	X	Drilled Shafts	May 1, 2001	Jan 1, 2002	255-264
GBSP3		High Performance Shotcrete	June 7, 1994	Jan 1, 2002	
GBSP4		Polymer Modified Portland Cement Mortar	June 7, 1994	Jan 1, 2002	
GBSP11		Permanent Steel Sheet Piling	Dec 15, 1993	Oct 1, 2002	
GBSP12		Drainage System	June 10, 1994	Jan 1, 2002	
GBSP13		Floating Bearing	Oct 13, 1988	June 23, 2003	
GBSP14		Jack and Remove Existing Bearings	April 20, 1994	June 24, 2003	
GBSP15		Three Sided Precast Concrete Structure	July 12, 1994	Mar 31, 2003	
GBSP16		Jacking Existing Superstructure	Jan 11, 1993	Jan 3, 2002	
GBSP17		Bonded Preformed Joint Seal	July 12, 1994	Jan 1, 2002	
GBSP18		Modular Expansion Joint	May 19, 1994	June 23, 2003	
GBSP19		Fabric Reinforced Elastomeric Trough	June 6, 1994	Sept 12, 2003	
GBSP21		Cleaning and Painting Contact Surface Areas of Existing Steel Structures	June 30, 2003		
GBSP22	X	Cleaning and Painting New Steel Structures	Sept 13, 1994	April 2, 2003	265-271
GBSP25		Cleaning and Painting Existing Metal Structures	Oct 2, 2001	April 7, 2003	
GBSP26		Containment and Disposal of Lead Paint Cleaning Residues	Oct 2, 2001	Mar 12, 2003	
GBSP28		Deck Slab Repair	May 15, 1995	June 23, 2003	
GBSP29		Bridge Deck Microsilica Concrete Overlay	May 15, 1995	June 23, 2003	
GBSP30	X	Bridge Deck Latex Concrete Overlay	May 15, 1995	June 23, 2003	272-283
GBSP31		Bridge Deck High-Reactivity Metakaolin (HRM) Concrete Overlay	Jan 21, 2000	June 23, 2003	
GBSP32		Temporary Sheet Piling	Sept 2, 1994	Dec 13, 2002	
GBSP33		Pedestrian Truss Superstructure	Jan 13, 1998	Sept 15, 2003	
GBSP34		Concrete Wearing Surface	June 23, 1994	Jan 1, 2002	
GBSP35		Silicone Bridge Joint Sealer	Aug 1, 1995	Dec 16, 2002	
GBSP36		Surface Preparation and Painting Req. for Weathering Steel	Nov 21, 1997	Jan 9, 2002	
GBSP37	X	Underwater Structure Excavation Protection.	April 1, 1995	Aug 21, 2002	284
GBSP38		Mechanically Stabilized Earth Retaining Walls.	Feb 3, 1999	Oct 6, 2003	
GBSP39		Precast, Prestressed Concrete Deck Beams Stage Constr.	Sept 1, 1994	Jan 1, 2002	
GBSP40		Fabric Reinforced Elastomeric Mat	July 14, 2000	Sept 12, 2003	
GBSP41		Bridge Joint Sealing System	May 1, 2001	Jan 1, 2002	
GBSP42		Drilled Soldier Pile Retaining Wall	Sept 20, 2001	April 25, 2003	
GBSP43		Driven Soldier Pile Retaining Wall	Nov 13, 2003	April 25, 2003	
GBSP44	X	Temporary Soil Retention System	Dec 30, 2002		285-286
GBSP45		Bridge Deck Thin Polymer Overlay	May 7, 1997	March 5, 2003	
GBSP46		Geotextile Retaining Walls	Sept 19, 2003		
GBSP47	X	High Performance Concrete Structures	Aug 5, 2002	Sept 10, 2003	287-289
GBSP48		Precast Concrete Structures	Sept 12, 2003		

## STATE OF ILLINOIS

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### SPECIAL PROVISIONS

The following Special Provisions supplement the "Standard Specifications for Road and Bridge Construction," adopted January 1, 2002, the latest edition of the "Manual on Uniform Traffic Control Devices for Streets and Highways," and the "Manual of Test Procedures for Materials" in effect on the date of invitation for bids, and the Supplemental Specifications and Recurring Special Provisions indicated on the Check Sheet included herein which apply to and govern the construction of Main Street Bridge over the West Branch of the DuPage River, Section: 96-00099-00-BR, Project BROS-00D1 (487), in Naperville, DuPage County, and in case of conflict with any part or parts of said Specifications, the said Special Provisions shall take precedence and shall govern.

Route: Main Street  
Section: 96-00099-00-BR  
County: DuPage  
Contract No. 83664

### LOCATION OF PROJECT

This project begins at Station 13+25.00, approximately 82 feet south of the centerline of Water Street, and extends north over the West Branch of the DuPage River to Station 16+55.00, approximately 75 feet north of the centerline of Chicago Avenue, all within the City of Naperville. The total length of the improvement in the north-south direction is 330 feet.

### DESCRIPTION OF PROJECT

This project consists of:

- Removal and reconstruction of the bridge substructure and superstructure
- Reconstruction of the approach slabs and portions of the approach pavements
- Construction of a low flow walkway
- Installation of water main and an electric duct bank
- Installation of lighting and landscaping

This project involves the removal of the existing three span concrete T-beam structure (Structure Number 022-6752), and the construction of a two span cast-in-place post-tensioned concrete slab structure (Structure Number 022-6755). The south abutment will be removed and reconstructed approximately 20 feet south of its existing location to accommodate the construction of a low flow walkway. The south abutment and center pier will be constructed with drilled shafts socketed into bedrock. The existing piers will be removed to below the surface of the weathered rock below the riverbed. The north abutment will be removed and reconstructed

on a spread footing keyed into the bedrock. Land-based overlooks will be constructed on the southeast and northwest corners of the bridge, adjacent to the proposed abutments, and founded on spread footings. The superstructure will be widened at mid-span on both sides of the structure for a pedestrian overlook centered on the pier. Approach slabs will be constructed on both sides of the bridge with pavement reconstruction and resurfacing of the intersections of Water Street and Chicago Avenue. Water main and an electric duct bank will be installed from the intersection of Water Street, extending north below the riverbed to the intersection of Chicago Avenue.

Work to be performed under this contract includes the following major items: superstructure removal and replacement, substructure removal and replacement, approach slab removal and replacement, storm sewer, water main, electric duct bank, combination concrete curb and gutter, bituminous concrete pavement reconstruction, bituminous concrete resurfacing, sidewalks, lighting, pavement markings, landscaping, architectural enhancements, and all incidental and collateral work necessary to complete the project as shown on the plans and as described herein.

Main Street will be closed to traffic from south of Water Street to Jackson Avenue. On Main Street south of the bridge, continuous access will be maintained north of Aurora Avenue to the entrance of Walgreens and the alley entrance to the west. On Chicago Avenue, local access will be maintained at all times with the allowance for U-turns to be permitted at the west end of the street. A single one-way lane will be maintained for westbound to northbound traffic on Chicago Avenue for the duration of the project with minimal closures due to construction sequencing.

#### **MAINTENANCE OF ROADWAYS**

Effective: September 30, 1985

Revised: November 1, 1996

Beginning on the date that work begins on this project, the Contractor shall assume responsibility for normal maintenance of all existing roadways within the limits of the improvement. This normal maintenance shall include all repair work deemed necessary by the Engineer, but shall not include snow removal operations. Traffic control and protection for maintenance of roadways will be provided by the Contractor as required by the Engineer.

If items of work have not been provided in the contract, or otherwise specified for payment, such items, including the accompanying traffic control and protection required by the Engineer, will be paid for in accordance with Article 109.04 of the Standard Specifications.

#### **NOISE LIMITATIONS**

All work within the defined limits of the project shall be performed between the hours of 7:00 AM and 7:00 PM, Monday through Thursday, and between 7:00 AM and 5:00 PM, Friday through Sunday, unless authorized at the sole discretion of the City Engineer. No work is to be performed on the holidays of New Year's Day, Memorial Day, 4<sup>th</sup> of July, Labor Day, Thanksgiving or Christmas.



DuPage County  
ROBERT J. SULLERSTROM  
COUNTY BOARD CHAIRMAN

## DEPARTMENT OF ECONOMIC DEVELOPMENT & PLANNING

BUILDING  
(630) 407-6700  
FAX (630) 407-6702

PLANNING  
(630) 407-6700  
FAX (630) 407-6702

STORMWATER PERMITTING  
(630) 407-6700  
FAX (630) 407-6701

ZONING/SUBDIVISION  
(630) 407-6700  
FAX (630) 407-6701

September 28, 2004

Mr. William J. Novak, P.E.  
City of Naperville  
400 South Eagle Street  
Naperville, IL 60540

RE: Certification for Stormwater Management Permit Application No. 04-25-0012/T12192  
Main Street Bridge Reconstruction, Incorporated Naperville, DuPage County, Illinois  
(NOTE: THIS IS NOT A PERMIT - A Building Permit must be picked up prior to any on site work)

Dear Mr. Novak:

The Stormwater Division and Wetland Division of the Department of Economic Development and Planning (EDP) received a stormwater permit application/submittal from Earth Tech, Inc., on behalf of the City of Naperville, for the reconstruction of the Main Street Bridge extending over the West Branch DuPage River, and all associated grading, to be located along Main Street between Jackson Avenue and Water Street, within the corporate limits of the City of Naperville, DuPage County, Illinois.

Staff has completed its review of this application and hereby certifies the following documents for compliance with the DuPage County Countywide Stormwater and Flood Plain Ordinance (DCSFPO) for a development within a Special Management Area (floodplain):

1. DuPage County Stormwater Management Permit Application, as assigned permit no. 04-25-0012 (EDP Tracking No. T12192).
2. Comment response letter addressed to David Winklebleck regarding the subject "Stormwater Management Permit Application No. 04-25-0012/T12192, Main Street Bridge Reconstruction, Incorporated Naperville, DuPage County, Illinois," as prepared by Earth Tech, Inc., dated September 15, 2004.
3. Stormwater submittal packet entitled "DuPage County Stormwater Management Permit Application, Main Street Bridge Reconstruction Project," as prepared by Earth Tech, Inc., Project No. 65154, dated September 2004, including the following removable documents:
  - a. Plan sheet entitled "Wetland Impact Areas on South Embankment," as prepared by Earth Tech, Inc., Contract No. 83664, dated July 9, 2004, with latest revision dated September 10, 2004, consisting of one (1) sheet labeled "Exhibit 3", as contained within Section V of the above referenced submittal packet; and,
  - b. Plan sheet entitled "Cross-Section 33.61," as prepared by Earth Tech, Inc., undated, consisting of one (1) sheet not labeled, as contained within Appendix A of the above referenced submittal packet; and,
  - c. Plan sheet entitled "Floodway Limits," as prepared by Earth Tech, Inc., Contract No. 83664, dated July 9, 2004, consisting of one (1) sheet labeled "23 of 62", as contained within Appendix A of the above referenced submittal packet; and,
  - d. Computer Disc, untitled, as prepared by unknown, undated, consisting of one (1) computer CD not labeled, as contained within Appendix C of the above referenced submittal packet; and,

E-mail: dec@dupageco.org

September 28, 2004

R11: Certification - SWP #04-25-0012/T12192 Main Street Bridge Reconstruction, Incorporated Naperville, DuPage County, IL

Page 2 of 2

- c. Supplemental information packet pertaining to above referenced computer CD, untitled, as prepared by unknown, undated, consisting of two pages not labeled, as contained within Appendix C of the above referenced submittal packet.
4. Plan set entitled "State of Illinois, Department of Transportation Division of Highways, Proposed Highway Plans, Main Street Over the West Branch of the DuPage River, Section 96-00099-00-BR, Bridge Replacement, Pavement Resurfacing and Reconstruction, Lighting and Utility Installation, Project: BROS-00D1 (487), City of Naperville, DuPage County, C-91-139-96," as prepared by Earth Tech, Inc., Contract No. 83664, consisting of sixty two (62) pages labeled "1 - 62 of 62", cover sheet signed by Michael Eichten, P.E. on July 8, 2004, with latest revision dated September 10, 2004 (identified on sheets 7, and 21 of 62).

Be advised the City of Naperville holds a partial waiver of enforcement status from the DuPage County Countywide Stormwater and Flood Plain Ordinance. As such, the City of Naperville is responsible to review and approve applications for stormwater management issues. Therefore, for the above referenced development project, our office has only reviewed and provided certification relating to the special management areas (floodplain). All approvals pertaining to the stormwater management facilities shall be done by the City of Naperville, unless requested otherwise.

Based upon our certification of the above referenced documents, our office hereby authorizes the City of Naperville to issue permits for the above referenced development. As a reminder, it is the City of Naperville's responsibility to enforce the provisions of the DCSFPO, including, but not limited to, the following conditions:

#### GENERAL CONDITIONS:

1. Per Section 15-116.1 of the DCSFPO, sediment and erosion control devices shall be functional before land is otherwise disturbed on the site. Therefore, the developer shall notify the City of Naperville and request/receive a site inspection of all required sediment and erosion control devices, prior to the commencement of construction activities.
2. Per section 15-149.2(f) of the DCSFPO, upon completion of development, as-built drawings of the site must be submitted to the City of Naperville for review and approval. The as-built drawings must be prepared, signed and sealed by an Illinois Registered Professional Engineer.

Enclosed, please find two (2) submittals as certified by our office. Please forward one (1) submittal onto the developer at time of permit issuance.

Respectfully,

*Clayton Heffter* - DRW

Clayton Heffter  
Stormwater Permitting Manager

CC11:drw

cc: Diedra Willis, USACE  
David Heslinga, P.E., Earth Tech, Inc., 111 N. Canal Street, Chicago, IL 60606  
Marty Michalisko, Engineering Resource Associates, Inc., 214 West Willow Ave., Wheaton, IL 60187  
Karen Laskowski, Wetland Program Manager, EDP  
Scott C. Lindebak, P.E., Senior Civil Engineer, DOE  
Kathy Huth-Nicholl, Division Assistant I, EDP  
File SWP #04-25-0012/T12192

S:\projects\9231 Naperville\2004\04-25-0012 (T12192) Main St Bridge Reconstruction\sub\us\CC1.doc

## DU PAGE COUNTY STORMWATER MANAGEMENT PERMIT APPLICATION

1. COMMUNITY AND STATUS <u>NAPERVILLE</u> Non <input checked="" type="checkbox"/> Partial <input type="checkbox"/> Complete	2. DATE APP. RECEIVED BY COMMUNITY (office use only) <u>2/27/04</u> <u>3/18/04</u>	3. STORMWATER APPLICATION/PERMIT NO. (to be assigned by community) <u>04-25-0002</u>	4. (Community use only) <u>7/12/92</u>						
5. (Community use only)									
6. NAME, ADDRESS/TITLE OF APPLICANT Dave Herling, P.E. Earth Tech, Inc. 111 North Canal Street Chicago, Illinois 60606 FAX NO. <u>312-902-7099</u> Telephone No. during business hours: <u>312-902-7100</u>		7. NAME AND ADDRESS OF OWNER Robert Kozurek, Engineering Manager City of Naperville 400 South Eagle Street Naperville, Illinois 60566-7020 FAX NO. <u>630-305-5986</u> Telephone No. during business hours: <u>630-305-4400 420-6013</u>							
8. Check all of the following conditions which apply: <input type="checkbox"/> The development does not affect a special management area. Attach a stormwater submittal. <input type="checkbox"/> Wetlands located on or near the development site. Development does not directly affect wetland. Attach a stormwater submittal and a wetland submittal. <input type="checkbox"/> The development affects a wetland but not a flood plain. Attach a stormwater submittal and a wetland submittal. <input checked="" type="checkbox"/> The development affects a flood plain but not a wetland. Attach a stormwater submittal and a flood plain/submittal. <input type="checkbox"/> The development affects both a flood plain and a wetland. Attach a stormwater submittal, and a flood plain/submittal, and wetland submittal.									
9. DESCRIPTION OF PROPOSED DEVELOPMENT: The City of Naperville wishes to replace existing Main Street Bridge over the West Branch of the DuPage River. The proposed structure is a two span cast-in-place post-tensioned concrete slab structure. The in stream work will consist of the removal of the existing substructure and the construction of a drilled shaft abutment on the south, a cantilever-type abutment on the north, and a open column drilled shaft pier in the center of the river. In addition, to the proposed modifications to the Main Street Bridge, a low flow walkway will be constructed along south abutment of the bridge, reconstruction of the bridge approach pavements, and pavement resurfacing.									
10. LOCATION OF DEVELOPMENT <u>Main Street Bridge branch of West DuPage River</u> State Authority <u>City of Naperville</u> Municipality <u>West Branch of DuPage River</u> Watershed Planning Area & Territory		11. LEGAL DESCRIPTION <table border="0"> <tr> <td><u>SE 13</u></td> <td><u>78 N</u></td> <td><u>9 E</u></td> </tr> <tr> <td>1/4 Section</td> <td>Township</td> <td>Range</td> </tr> </table> PC No. _____		<u>SE 13</u>	<u>78 N</u>	<u>9 E</u>	1/4 Section	Township	Range
<u>SE 13</u>	<u>78 N</u>	<u>9 E</u>							
1/4 Section	Township	Range							
12. UNDER PENALTY OF INTENTIONAL MISREPRESENTATION AND/OR PERJURY, I declare that I have examined and/or made this application and it is true and correct to the best of my knowledge and belief. I agree to construct said improvement in compliance with all provisions of the applicable ordinance. I realize that the information that I have affirmed herein forms a basis for the issuance of the stormwater management permit(s) herein applied for and approval of plans in connection therewith shall not be construed to permit any construction upon said premises or use thereof in violation of any provision of any applicable ordinance or to exonerate the owner of his responsibilities in the form complying therewith. <u>David P. Herling</u> <u>02/25/04</u> <u>Robert Kozurek</u> <u>2/27/04</u> Signature of Applicant Date Signature of Owner Date									

13. PERMIT REVIEW FEE (separate checks)		(office use only)	
Community	Amount	Received By/Title	
DuPage County Environmental Concerns	<u>\$ 1,170.00</u>	<u>\$ 950.00 KHN-ORW</u> <u>\$ 170.00 KHN 7/28/04</u>	
14. PROBABLE COST	Amount	15. SECURITIES	
Estimate of probable cost of construction of stormwater facilities	_____	Development Security _____	
Estimate of probable cost of implementation/maintenance of treatment and erosion plan	_____	Sediment and Erosion Control Security _____	
		TOTAL SECURITY _____	
16. FINAL APPROVALS		Date	
Community	Date	Approved By/Title	
DuPage County Environmental Concerns Certification	<u>9/28/04</u>	<u>Clayton Kuffner-ORW</u>	
DuPage County Stormwater Permit Issued	_____	_____	
Unless otherwise noted, this permit expires December 31 of the third year following the date of permit issuance.		<b>CERTIFIED</b> BY: <u>CCH/DRW</u> <u>SEP 28 2004</u> <u>SWP# 04-25-0012/7/2/92</u> DuPage County Dept. Of Development & Stormwater Management Division Permit Unit	
17. SPECIAL CONDITIONS			

(199)

White Community

Green-DRC Permit

Canary-Applicant Permit

Pink DRC

Gold-Permit Application

**STATUS OF UTILITIES TO BE ADJUSTED**

Effective: January 30, 1987      Revised: July 1, 1994

The plans represent the best information available to the Department. The applicable portions of Articles 105.07 and 107.31 of the Standard Specifications shall apply.

Utility companies involved in this project are listed below:

City of Naperville  
Department of Public Utilities  
Electric Engineering  
1392 West Aurora Avenue  
Naperville, IL 60540  
(630) 420-6190

City of Naperville  
Department of Public Utilities  
Water Department  
3612 Plainfield/Naperville Road  
Naperville, IL 60566-3020  
(630) 305-5320

NICOR Gas  
90 North Finley Road  
Glen Ellyn, IL 60137  
(630) 629-2500

Comcast  
1304 Marquette Drive  
Romeoville, IL 60466  
(630) 226-3769

Ameritech – SBC  
162 South York Road  
Elmhurst, IL 60126  
(630) 941-4212

AT&T Local  
4513 Western Avenue  
Lisle, IL 60532  
(630) 810-6915

AT&T Long Telecom General  
212 Ontario Street  
Frankfort, IL 60622  
(630) 852-4533

The City of Naperville Department of Public Utilities will be installing a new water main and electric duct bank as part of the Chicago Avenue and Main Street Utility Improvements on the north side of the bridge in the Fall of 2004. This work has been scheduled in advance of the Main Street Bridge Project to simplify the maintenance of traffic and utility improvements to be completed as part of the bridge project. These utility improvements have been shown on these plans as existing.

**START OF WORK**

The Contractor will not be allowed to proceed with any construction operations prior to January 3, 2005. The Contractor shall complete all construction work necessary to safely open Main Street to pedestrians and traffic on or before November 23, 2005.

**INCENTIVE/DISINCENTIVE**

Date of Completion: The Contractor shall schedule his/her operations so as to complete all work necessary to open all the vehicular and pedestrian traffic on or before November 23, 2005. The Contractor shall schedule his/her operation so as to complete all miscellaneous work items



on or before December 2, 2005. **A construction moratorium will be enforced between December 2, 2005 and January 5, 2006.** The City may allow weather dependent items of work, namely, permanent pavement marking, landscaping, and anti-graffiti coatings to be extended to May 5, 2006. These items of work will not be subject to Liquidated Damages beyond the December 2, 2005 date. The Contractor shall note that this completion date is based on an expedited work schedule.

**Failure to Complete the Work on Time:** Should the Contractor fail to complete the work on or before the specified completion date, or within such extended time as may have been allowed by the City of Naperville, the Contractor shall be liable to the City of Naperville in the amount listed below, not as a penalty but as liquidated and ascertained damages for each calendar day beyond the date of completion or extended time as may have been allowed. Such damages may be deducted by the City of Naperville from any monies due the Contractor.

In fixing the damages as set out herein, the desire is to establish a certain mode of calculation for the work since the City of Naperville's actual loss, in the event of delay, cannot be predetermined, would be difficult of ascertainment, and a matter of argument and unprofitable litigation. This said mode is an equitable rule for measurement of the City of Naperville's actual loss and fairly takes into account the loss of use of the roadway if the project is delayed in completion. The City of Naperville shall not be required to provide any actual loss in order to recover these liquidated damages provided herein, as said damages are very difficult to ascertain. Furthermore, no provision of this clause shall be construed as a penalty, as such is not the intention of the parties.

**Liquidated Damages Limits:**

1. Vehicular and Pedestrian Traffic (November 23, 2005): \$2, 500/Calendar Day
2. Miscellaneous Work Items (December 2, 2005): \$1, 100/Calendar Day
3. Weather Dependent Items as specified above (May 5, 2006): \$1,100/Calendar Day

A calendar day is every day shown on the calendar and starts at 12:00 midnight and ends at the following 12:00 midnight, twenty-four hours later. No payment will be paid for any day less than twenty-four hours.

**Incentive Payment Plan:** The nature of this project is such that the use of the roadway and bridge cannot be safely and efficiently used until all roadway work is essentially complete. On this basis, the Contractor shall be entitled to an Incentive Payment for the completion of all work necessary to open vehicular and pedestrian traffic as set forth by the date of completion.

The Incentive Payment shall be paid at the rate of \$1500 per calendar day for each day of completion prior to November 23, 2005. The maximum payment under this incentive plan will be limited to \$15,000 or 10 calendar days.

A calendar day is every day shown on the calendar and starts at 12:00 midnight and ends at the following 12:00 midnight, twenty-four hours later. No payment will be paid for any day less than twenty-four hours.

Should the Contractor be delayed in commencement, prosecution, or completion of the work for any reason, there shall be no extension of the incentive payment calculation date. No Incentive Payment will be made if the Contractor fails to complete the work before the specified date of completion. Failure of the Contractor to complete all work as required by the contract before November 23, 2005, shall release and discharge the City of Naperville and all of its officers,

agents and employees from any and all claims and demands for the payment of any incentive amount of damages arising from the refusal to pay any incentive amount.

### **VANDALISM**

Any finished work including finished concrete and asphalt which has been vandalized shall be replaced, not repaired, by the Contractor at their expense.

### **TREE REMOVAL**

Effective: January 1, 1998

This work shall consist of tree removal as specified in Section 201 of the Standard Specifications with the following revisions:

Delete sentences 4 and 5 of Article 201.04, Tree Removal, and substitute the following:

"All trees removed shall be cut flush with the natural ground line. All stubs and stumps shall be treated with a resprout herbicide approved by the Engineer to prevent regrowth from those stumps."

### **RECLAIMED ASPHALT PAVEMENT FOR NON-POROUS EMBANKMENT AND BACKFILL**

Effective: April 1, 2001

Add the following sentence to Article 1004.06 (a) Description of the Standard Specifications for Road and Bridge Construction:

"Reclaimed Asphalt Pavement (RAP) may be used as aggregate in Non-porous Granular Embankment and Backfill. The Rap material shall be reclaimed asphalt pavement material resulting from the cold milling or crushing of an existing hot-mix bituminous concrete pavement structure, including shoulders. RAP containing contaminants such as earth, brick, concrete, sheet asphalt, sand, or other materials identified by the Department will be unacceptable until the contaminants are thoroughly removed.

Add the following sentence to Article 1004.06 (C) Gradation of the Standard Specifications for Road and Bridge Construction.

"One hundred percent of the RAP when used shall pass the 75mm (3 inch) sieve. The RAP shall be well graded from coarse to fine. RAP that is gap-graded or single-sized will not be accepted.

**RECLAIMED ASPHALT PAVEMENT (RAP) FOR TEMPORARY ACCESS ENTRANCES  
AND/OR AGGREGATE SHOULDERS, TYPE B**

Effective: April 1, 2001

Replace the Note in Articles 402.02(a) and 481.02(a) of the Standard Specifications for Road and Bridge Construction with the following:

"Note: Reclaimed asphalt pavement (RAP) may be used as aggregate in surface course for temporary access entrances and/or aggregate shoulders Type B. The RAP material shall be reclaimed asphalt pavement material resulting from the cold milling or crushing of an existing hot-mix bituminous concrete pavement structure, including shoulders. RAP containing contaminants such as earth, brick, concrete, sheet asphalt, sand, or other materials identified by the Department will be unacceptable until the contaminants are thoroughly removed. The RAP shall also meet the following requirements:

One hundred percent of the RAP material shall pass the 37.5 mm (1 1/2 inch) sieve. The RAP material shall be reasonably well graded from coarse to fine. RAP material that is gap-graded or single-sized will not be accepted."

**APPROACH SLAB REMOVAL**

This work shall consist of the complete removal of existing approach slab including bituminous overlays, reinforcing bars, and sleeper slabs, at locations designated in the plans and in accordance with the applicable portions of Sections 440 and 501 of the Standard Specifications.

This work shall also include the removal of existing timber piles and pile caps to at least 300mm (1 ft) below the proposed elevation of sub grade or ground surface, within the area of construction and within the limits of the right of way. This work shall also include the removal of any mud jack cylinders encountered within the existing approach slabs.

The Contractor shall remove the existing approach slabs in a manner so as not to damage the adjacent structures that are to remain.

Basis of Payment: This work shall be paid for at the contract unit price per square yard for APPROACH SLAB REMOVAL, which price shall include all labor and equipment necessary to remove and dispose of the entire approach slab pavement.

**BRIDGE APPROACH PAVEMENT (SPECIAL)**

Description: This work shall consist of the construction of bridge approach pavements in accordance with the applicable portions of Section 420 of the Standard Specifications and as detailed in the plans. Longitudinal construction joint in the bridge approach pavement shall be in accordance with the details in the plans. Labor and material for these tie bars shall not be paid for separately but included in the cost of BRIDGE APPROACH PAVEMENT (SPECIAL). As indicated on the plans, the shoulder pavements and parapets at IRE walls, and single face concrete barrier will all be paid for separately.

Method of Measurement: BRIDGE APPROACH PAVEMENT, SPECIAL will be measured for payment in square yards according to the pay limits indicated on the plan details for each approach.

Basis of Payment: This work will be paid for at the contract unit price per square yard for BRIDGE APPROACH PAVEMENT (SPECIAL) which price includes payment in full for tie bars, expansion joint, preformed joint seal, polyethylene bond breaker, reinforcement bars, concrete pad (including reinforcement and excavation).

#### **TRENCH AND BACKFILL IN PAVEMENT**

Effective: February 27, 1997

The construction and backfilling of a Trench shall meet the requirements of the applicable portions of 208 of the Standard Specifications, except as revised with this Special Provision.

The Trench shall not be less than 12" in depth. It shall be installed after milling and prior to resurfacing.

Trench and Backfill Special for the galvanized steel conduits shall be installed in the following manner:

1. The pavement shall be sawcut to a minimum width of 4". (A cutting wheel may be used).
2. The trench shall be excavated to a depth of 12" below the pavement bottom. Material removed shall be disposed of outside the R.O.W.
3. The galvanized steel conduit shall be installed in the trench.
4. The trench will be backfilled and compacted with materials equivalent in kind to the previous existing conditions or as directed by the Engineer.
5. Existing pavement shall be replaced with concrete. Where bituminous surface exists, 1-1/2 inches of bituminous surface coarse shall be laid on top of the concrete to blend in with the existing surface.
6. If required by the Engineer, metal plates of adequate size and weight shall be placed over the Trench and shall remain for a minimum of 48 hours. The plates shall cover the sawcut during any time that work is being done.
7. Two (2) lanes of traffic shall be provided at all times.

Basis of Payment. This work will be paid for at the contract unit price per foot, measured in place, for TRENCH AND BACKFILL IN PAVEMENT, which price shall include the cost of all sawcutting, excavation, furnishing and placing all backfill material, and the disposal of surplus excavations.

**BACKFILLING STORM SEWER UNDER ROADWAY**

Effective: September 30, 1985

Revised: July 2, 1994

For storm sewer constructed under the roadway, backfilling methods two and three authorized under the provisions of Article 550.07 will not be allowed.

**STORM SEWER ADJACENT TO OR CROSSING WATER MAIN**

Effective: February 1, 1996

Revised: March 31, 1998

This work consists of constructing storm sewer of the specified diameter adjacent to or crossing water main, at the locations shown on the plans, meeting the material and installation requirements of the latest edition of the "Standard Specifications for Water and Sewer Main Construction in Illinois", and the applicable portions of Section 550 of the Standard Specifications.

Pipe materials shall meet the requirements of Sections 40 and 41-2.01 of the "Standard Specifications for Water and Sewer Main Construction in Illinois", except PVC pipe will not be allowed. Ductile-Iron pipe shall meet the minimum requirements for Thickness Class 50.

Encasing of standard type storm sewer, in accordance with the details for "Water and Sewer Separation Requirements (Vertical Separation)", (DIV. V/STANDARD DRAWINGS) in the "Standard Specifications for Water and Sewer Main Construction in Illinois", may be used for storm sewers crossing water mains.

Basis of Payment: This work will be paid for in accordance with Article 550.09 of the Standard Specifications, except the pay item shall be STORM SEWER (WATER MAIN REQUIREMENTS), of the diameter specified, and shall include all materials, labor, equipment, concrete collars and encasing pipe with seals.

**TEMPORARY DRAINAGE**

This work consists of maintaining existing storm sewer outfalls to the river. The contractor is made aware that there is existing storm sewer outfalls of varying size from 12-inch diameter to a 60-inch equivalent elliptical pipe. The contractor must provide adequate capacity for these existing pipes through or around his construction activities at all times. The contractor must submit his proposed temporary drainage methods to the engineer for approval prior to removing or obstructing any existing storm sewer outfall. This work will be paid for at the contract lump sum amount for TEMPORARY DRAINAGE.

**TEMPORARY ACCESS ROAD (SPECIAL)**

Revise Article 402.10 of the Standard Specifications to read:

**"402.10 For Temporary Access.** The contractor shall construct and maintain aggregate surface course for a temporary access road according to Article 402.07 and as directed by the Engineer.

The aggregate surface course shall be constructed to the dimensions and grades specified below, except as modified by the plans or as directed by the Engineer.

Access Road. The minimum width shall be 16 ft. The minimum compacted thickness shall be 12 in.

Maintaining the temporary access road shall include relocating and/or regrading the aggregate surface coarse for any operation that may disturb or remove the temporary access. The same type and gradation of material used to construct the temporary access shall be used to maintain it.

Temporary Access Roads may impact existing finished paver walkways and streetscape appurtenances. The Contractor will protect these items. Any damage to these existing items will require their replacement to the satisfaction of the City. This work will not be paid for separately, but will be the sole responsibility of the Contractor.

When use of the temporary access is discontinued, the aggregate shall be removed and utilized in the permanent construction or disposed of according to Article 202.03."

Add the following to Article 402.12 of the Standard Specifications:

"Aggregate surface course for temporary access will be measured for payment as each for every access road constructed for the purpose of temporary access. If the road is to be constructed under multiple stages, the aggregate needed to construct the second or subsequent stages will not be measured for payment but shall be included in the cost per each of the type specified."

Revise the second paragraph of Article 402.13 of the Standard Specifications to read:

"Aggregate surface course for temporary access will be paid for at the contract unit price per each for TEMPORARY ACCESS ROAD (SPECIAL)."

Partial payment of the each amount bid for temporary access, of the type specified, will be paid according to the following schedule:

- (a) Upon construction of the temporary access, sixty percent of the contract unit price per each, of the type constructed, will be paid.
- (b) Subject to the approval of the Engineer for the adequate maintenance and removal of the temporary access, the remaining forty percent of the pay item will be paid upon the permanent removal of the temporary access."

### PEDESTRIAN PROTECTION

This work will consist of installing and removing temporary barriers to separate pedestrian walkways from construction activities at locations shown on the plans or as directed by the Engineer. Barriers will be 8-feet in height, constructed of construction grade plywood secured to or erected with wood framing. All exposed surfaces and corners shall be smooth and painted with exterior latex paint as approved by the Engineer. The contractor will insure that the temporary barrier, framing and anchoring is of sufficient integrity to withstand wind loading and

pedestrian traffic. Pedestrian protection is not intended to provide vehicular protection for work zones. This work will be paid at the contract unit price per foot for PEDESTRIAN PROTECTION, measured longitudinally along pedestrian walkways, which price includes all labor, materials and equipment necessary to install and remove barriers as specified herein.

#### **TEMPORARY CHAIN LINK FENCE, 8'**

Description: This item shall consist of constructing a chain link fence 8 feet high and any gates necessary, or as shown on the contract plans, as ordered by the Engineer, and in accordance with Section 664 of the Standard Specifications, except as modified herein.

No additional compensation shall be provided for mounting posts into existing sidewalk, pavement, curb and gutter or any other surface encountered.

Upon completion of the project or as directed by the Engineer, the fence, gates, posts and all other fence hardware shall be removed from the job site and become the property of the Contractor. The salvage value of the fence shall be reflected in the bid price. All postholes shall be filled and compacted with a material similar to the surrounding material and as per the Engineer.

This item shall also include as incidental any work necessary to remove, relocate and reinstall fencing as shown on the plans and as directed by the Engineer for the purpose of staged construction.

Method of Measurement: The installation of temporary chain link fence shall be measured for payment in place per foot. The length paid will be the overall length, parallel to the ground slope, from center to center of end posts.

Basis of Payment: This work shall be for at the contract unit price per foot for TEMPORARY CHAIN LINK FENCE, 8', which price shall be considered payment in full for completing this work as specified including installing and removing chain link fence, gates, all excavation, backfilling and all labor, tools, equipment and incidental items as shown on the plans and as specified herein to complete this item.

#### **CHAIN LINK FENCE REMOVAL**

This work shall consist of removing fencing, posts, hardware and foundations at locations shown on the plans. The materials shall be legally disposed of off-site.

Method of Measurement: This work shall be measured on a per foot basis measured horizontally from end post to end post.

Basis of Payment: This work shall be for at the contract unit price per foot for CHAIN LINK FENCE REMOVAL, which price shall be considered payment in full for completing this work as specified including all labor, tools, equipment and incidental items as shown on the plans and as specified herein to complete this item.

## **STORM SEWER REMOVAL**

**Description:** This work shall consist of the removal of storm sewers, including laterals.

**Construction:** Existing storm sewers shall be removed in accordance with applicable sections of Article 551.02. Materials shall be disposed of by the Contractor according to Article 202.03.

If an existing structure at the end of a removed storm sewer is not to be removed, the abandoned structure opening shall be sealed with Class SI Concrete or brick and mortar in a manner satisfactory to the Engineer.

Trenches resulting from the removal of storm sewers shall be backfilled with trench backfill material according to the applicable requirements of Article 550.07.

**Method of Measurement:** Storm sewer removal of the various diameters will be measured for payment in feet, measured as removed.

Trench backfill will be measured for payment as specified in Article 208.03.

**Basis of Payment:** Storm sewer removal will be paid for at the contract unit price per foot for **STORM SEWER REMOVAL**, of the diameter specified, which price shall include all excavation and backfilling, removing and disposing of the pipe, and sealing structure openings when necessary.

Trench backfill will be paid for as specified in Article 208.04.

## **STORM SEWERS, DUCTILE IRON PIPE**

### **STORM SEWERS, DUCTILE IRON PIPE, CLASS 52, 12"**

This item consists of furnishing and installing ductile iron sewer pipe in accordance with the applicable portions of Sections 550 and 563 of the Standard Specifications, the Illinois Plumbing Code, the Standard Specifications for Water and Sewer Main Construction in Illinois and these Special Provisions. Installations shall include short connections of existing sewer to new structures; new sewers shown on the drawings; and reconnections of storm sewer services, found during construction, to the new storm sewer.

Materials shall be as follows:

1. Ductile Iron Pipe, Class 52, AWWA C151 (ASTM A21.51) with rubber gasketed Pipe Joints:
2. Pipe Markings:
  - a. Manufacturer's name or trademark.
  - b. Nominal pipe size.
  - c. DIP Class.

**Basis of Measurement:** This work will be measured per foot of sewer actually installed as measured horizontally between connection points, or manhole center.



Basis of Payment: This work will be paid for at the contract unit price per foot, for STORM SEWERS, DUCTILE IRON PIPE, CLASS 52 of the diameter required, which price shall include bedding and cover, connections, and all other labor, material, and equipment necessary to complete the work.

#### **CLEANING EXISTING DRAINAGE STRUCTURES**

Effective: September 30, 1985

November 1, 1996

All existing storm sewers, pipe culverts, manholes, catch basins and inlets shall be considered as drainage structures insofar as the interpretation of this Special Provision is concerned. When specified for payment, the location of drainage structures to be cleaned will be shown on the plans.

All existing drainage structures which are to be adjusted or reconstructed shall be cleaned in accordance with Article 602.14 of the Standard Specifications. This work will be paid for in accordance with Article 602.15 of the Standard Specifications.

All other existing drainage structures which are specified to be cleaned on the plans will be cleaned in accordance with Article 602.14 of the Standard Specifications. This work will be paid for at the contract unit price each for DRAINAGE STRUCTURES TO BE CLEANED, and at the contract unit price per meter (foot) for STORM SEWERS TO BE CLEANED.

#### **TRAFFIC CONTROL PLAN**

Effective: September 30, 1985

Revised: October 1, 1995

Traffic Control shall be in accordance with the applicable sections of the Standard Specifications, the Supplemental Specifications, the "Illinois Manual on Uniform Traffic Control Devices for Streets and Highways", any special details and Highway Standards contained in the plans, and the Special Provisions contained herein.

Special attention is called to Article 107.09 of the Standard Specifications and the following Highway Standards, Details, Quality Standard for Work Zone Traffic Control Devices, Recurring Special Provisions and Special Provisions contained herein, relating to traffic control.

The Contractor shall contact the District One Bureau of Traffic at least 72 hours in advance of beginning work.

STANDARDS:            701801        702001        704001

DETAILS:      Detour Plan  
                Maintenance of Traffic Plans  
                Pavement Marking Letters and Symbols for Traffic Staging  
                Traffic Control and Protection for Side Roads, Intersections, and Driveways

SPECIAL PROVISIONS: Maintenance of Roadways  
Traffic Control and Protection for Temporary Detour  
Work Zone Traffic Control (Lump Sum Payment)  
Traffic Control For Work Zone Areas

**TRAFFIC CONTROL AND PROTECTION FOR TEMPORARY DETOUR**

Effective: September 1, 1995

Revised: January 1, 1997

When traffic is to be directed over a detour route, the Contractor shall furnish, erect, maintain and remove all applicable traffic control devices along the detour route.

Furnishing, erecting, maintaining and removing traffic control devices along detour routes, in accordance with the details shown in the plans, will be paid for at the contract unit price each for TRAFFIC CONTROL AND PROTECTION FOR TEMPORARY DETOUR.

**WORK ZONE TRAFFIC CONTROL (LUMP SUM PAYMENT)**

Effective: February 1, 1996

Revised: November 1, 1996

Specific traffic control plan details and Special Provisions have been prepared for this contract.

Method of Measurement: All traffic control (except traffic control pavement marking) indicated on the traffic control plan details and specified in the Special Provisions will be measured for payment on a lump sum basis. Traffic control pavement markings will be measured per meter (foot).

Basis of Payment: All traffic control and protection will be paid for at the contract lump sum price for TRAFFIC CONTROL AND PROTECTION (SPECIAL). This price shall be payment in full for all labor, materials, transportation, handling and incidental work necessary to furnish, install, maintain and remove all traffic control devices required as indicated in the plans and as approved by the Engineer.

SHORT TERM PAVEMENT MARKING, TEMPORARY PAVEMENT MARKING and PAVEMENT MARKING TAPE TYPE III will be paid for separately.

**TRAFFIC CONTROL FOR WORK ZONE AREAS**

Effective: 9/14/95 Revised: 1/30/03

Work zone entry and exit openings shall be established daily by the Contractor with the approval of the Engineer. All vehicles including cars and pickup trucks shall exit the work zone at the exit openings. All trucks shall enter the work zone at the entry openings. These openings shall be signed in accordance with the details shown elsewhere in the plans and shall be under flagger control during working hours.

The Contractor shall plan his trucking operations into and out of the work zone as well as on to and off the expressway to maintain adequate merging distance. Merging distances to cross all lanes of traffic shall be no less than 1/2 mile. This distance is the length from where the trucks enter the expressway to where the trucks enter the work zone. It is also the length from where

the trucks exit the work zone to where the trucks exit the expressway. The stopping of expressway traffic to allow trucks to change lanes and/or cross the expressway is prohibited.

Failure to comply with the above requirements will result in a Traffic Control Deficiency charge. The deficiency charge will be calculated as outlined in the special provision for "**TRAFFIC CONTROL DEFICIENCY DEDUCTION**". The Contractor will be assessed this daily charge for each day a deficiency is documented by the Engineer.

### **TEMPORARY INFORMATION SIGNING**

**Description:** This work shall consist of furnishing, installing, maintaining, relocating for various states of construction and eventually removing temporary informational signs. Included in this item may be ground mount signs, skid mount signs, truss mount signs, bridge mount signs, and overlay sign panels which cover portions of existing signs.

**Materials:** Materials shall be according to the following Articles of Section 1000 – Materials:

	<u>Item</u>	<u>Article/Section</u>
a)	Sign Base (notes 1 & 2)	1090
b)	Sign Face (Note 3)	1091
c)	Sign Legends	1092
d)	Sign Supports	1093
e)	Overlay Panels (Note 4)	1090.01

Note 1. The Contractor may use 16mm (5/8 inch) instead of 19mm (3/4 inch) thick plywood.

Note 2. Type A sheeting can be used on the plywood base.

Note 3. All sign faces shall be Type, A except all orange signs shall meet the requirements of Article 1084.02(b).

Note 4. The overlay panels shall be 2mm (0.08 inch) thick.

**Installation:** The sign sizes and legend sizes shall be verified by the Contractor prior to fabrication.

Signs which are placed along the expressway shoulder and/or within the construction zone shall be installed according to the requirements of Article 702.05 and Article 720.04. The signs shall be 2.1m (7') above the near edge of the pavement and shall be a minimum of 600mm (2') beyond the edge of the paved shoulder. A minimum of 2 posts shall be used.

The attachment of temporary signs to existing sign structures or sign panels shall be approved by the Engineer. Any damage to the existing signs due to the Contractors operations shall be repaired or signs replaced, as determined by the Engineer, at the Contractors expense.

Signs which are placed on overhead bridge structures shall be fastened to the handrail with stainless steel bands. These signs shall rest on the concrete parapet where possible. The Contractor shall furnish mounting details for approval by the Engineer.

**Method Of Measurement:** This work shall be measured for payment in square meters (square feet) edge to edge (horizontally and vertically).

All hardware, posts or skids, supports, bases for ground mounted signs, connections, which are required for mounting these signs will be included pas part of this pay item.

Basis of Payment: This work shall be paid for at the contract unit price per square meter (square foot) for TEMPORARY INFORMATION SIGNING, which price shall be full compensation for all labor, equipment and materials required for performing the work as herein specified.

### **CHANGEABLE MESSAGE SIGNS**

This item shall be as contained in the Special Provisions for "Portable Changeable Message Signs" except as follows:

"This message panel shall also be capable of being controlled by an IBM compatible computer from a remote location via a cellular linkage. The Contractor shall supply the modem, the cellular phone, and the necessary software to run the sign from a remote computer at a location designated by the engineer. The Contractor will also be required to promptly reprogram the computer to provide all messages as directed by the Engineer".

Two (2) signs will be required for this contract.

### **RUSTICATION FINISH**

#### **Description:**

This work shall consist of furnishing and installing form-liners in the concrete formwork as shown on the plans and as specified herein for concrete finishes indicated as "Rustication Finish". All concrete structures including those that include Rustication Finish as specified in this Special Provision shall follow the applicable portions of Section 503 of the Standard Specifications.

#### **Materials:**

Form Liner: Milestones Incorporated Form liners or approved equal as specified below. Form liner to be formed from real stone, manufactured with 3/4" marine plywood backing, available in multiple use and /or limited use, and designed to hide liner shape and pattern repeat.

Milestones Incorporated  
235 Monroe Street  
Hudson, Wisconsin

Contact: Paul Nasvik, President  
Phone: (715) 381-9660  
Fax: (715) 381-9679

1. Pattern Name: MS-1006 Small Random Ashlar
2. Pattern Relief: 2"
3. Total Liner Thickness: 3"

Surface Applied Finish/Color: L.M. Scofield Company or approved equal as specified below. The surface applied finish shall be applied to all form liner and imprinted concrete surfaces or as directed by the Engineer. The Contractor shall submit a sample for review prior to application.

L.M. Scofield Company  
Phone: (800) 800-9900

4. Product: Lithochrome Chemstain Classic
5. Color: CS-15 Antique Amber

**Construction:**

The Contractor shall submit proposed construction procedures for the rustication finish on the outside face of the elements indicated on the plans. The Contractor's method of obtaining the surface texture specified on the plans shall be subject to approval by the Engineer.

Upon approval of the construction procedures by the Engineer, the Contractor shall pour a 9 m (30 feet) long test section at a location directed by the Engineer. After removal of the formwork, the Engineer will examine the test section and instruct the Contractor if the rustication finish is acceptable or if future sections need further modifications. If necessary, the Contractor shall pour additional test sections at locations designated by the Engineer until a section meets with the Engineer's approval. The rustication finish of all subsequently installed wall sections shall match the approved test section. All deviations from the approved rustication finish shall be repaired by the Contractor to the satisfaction of the Engineer at no additional cost to the contract.

The Contractor shall notify the Engineer at least 40 hours prior to placing concrete. Concrete shall not be placed until the Engineer has inspected the formwork and the placement of reinforcing bars for compliance with the plans.

In addition to what said above the Contractor shall do the following:

- A. Clean and repair surfaces of forms to be reused in the Work. Split, frayed, delaminated, or otherwise damaged form-facing material will not be acceptable for exposed surfaces. Apply new form-release agent.
- B. When forms are reused, clean surfaces, remove fins and laitance, and tighten to close joints. Align and secure joints to avoid offsets. Do not use patched forms for exposed concrete surfaces unless approved by Architect.
- C. Form Liner Finishes: As-cast concrete texture imparted by form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Repair and patch tie holes and defective areas. Remove fins and other projections exceeding 1/8 inch in height.

**Method of Measurement:** The completed RUSTICATION FINISH will be measured in square feet along the face of the finished surface, which outline plane area.

**Basis of Payment:** The rustication finish, measured as specified, will be paid for at the contract unit price per square foot for RUSTICATION FINISH. These prices shall be payment in full for all labor, materials, equipment, and manufacturer's technical support required for formwork preparation and form liners installation.

## **PEDESTRIAN RAILING**

**Description:** This item of work shall consist of furnishing all materials, tools, equipment and labor required to complete the fabrication and installation of the Pedestrian Railing as detailed on the Plans and described herein.

**General:** The Pedestrian Railing shall be in accordance with Sections 505, 506 and 509 of the Standard Specifications except as noted. Hollow structural steel tubing shall conform to the requirements of ASTM A500, Grade B, Structural Steel Tubing. All other steel shapes and plates shall conform to the requirements of AASHTO M-270 M Grade 250. The machine bolts and washers shall be stainless steel with the machine bolts meeting the requirements of ASTM F738M, Class A1-80.

The railing shall be painted in the shop and field touch-up damaged portions shall be required as necessary.

**Method of Measurement:** The Pedestrian Railing will be measured for payment in feet. The length paid for will be the overall length along the top longitudinal railing member through all posts and gaps.

**Basis of Payment:** This item of work will be paid for at the contract unit price per foot for PEDESTRIAN RAILING, which price shall include furnishing all labor, tools, equipment and materials to fabricate, furnish and erect the Pedestrian Railing as shown on the Plans, described herein and as directed by the Engineer.

## **PIPE UNDERDRAIN FOR STRUCTURES, 6"**

**Description:** This work shall consist of furnishing all materials, equipment and labor required for the installation of pipe underdrains wrapped in a geotextile fabric lined envelope in accordance with the applicable portions of Section 601 of the Standard Specifications, as shown on the Plans and as directed by the Engineer.

**Handling and Storage:** Fabric shall be delivered to the job site in such a manner to facilitate handling and incorporation into the work without damage. In no case shall the fabric be stored and exposed to direct sunlight that might significantly diminish its strength and toughness.

**Installation:** Loosely roll out geotechnical fabric in such a manner that the edge of the fabric is approximately 30" from the face of the structure, allowing 12" minimum lap beneath the backfill. The fabric should not be stretched so that it will tear when the aggregate is placed. Successive lengths of fabric shall overlap a minimum of 24" to assure continuity of the filter. Enough fabric shall remain uncovered to provide for the fabric to overlap 12" at the top of the envelope.

The first lift of backfill, Course Aggregate CA 5 or CA 7, shall be placed to an elevation as shown on the Plans. The perforated pipe underdrain shall then be placed in the trench with the perforations down. After the pipe installation has been inspected and approved, the remaining area shall then be backfilled to a circumference approximately 18" around the pipe as shown on the details in the Plans. During the backfill operations, the Contractor will be required to support the outside of the fabric to maintain the required dimensions of the backfill envelope.

Following the backfilling operation, the fabric shall be lapped over the top and then covered with the specified material to the proposed grade as shown in the Plans.

If the fabric should become torn or damaged after installation, a patch will be placed over the torn area with a minimum of 24" around the damaged section.

Method of Measurement: Pipe Underdrains for Structures 6" shall be measured for payment in place per foot of length.

Basis of Payment: This work will be paid for at the contract unit price per foot for PIPE UNDERDRAINS FOR STRUCTURES, 6". The unit bid price for Pipe Underdrains for Structures, 6" shall include the furnishing of pipe underdrain and connecting hardware, providing compacted impervious material below the pipe underdrain, furnishing and placing the geotextile fabric, placing the pipe, furnishing and placing bedding, backfilling with aggregate and all other labor and equipment necessary to complete this item of work as indicated on the Plans.

## **BRIDGE EXPANSION JOINT SYSTEM**

**Description:** This work shall consist of furnishing and installing an expansion or fixed joint system as shown on the plans and as specified herein. The joint system shall be comprised of either steel locking edge rails or plates, with studs and a preformed elastomeric seal. Unless noted otherwise, the Contractor shall have the option of choosing from the preformed elastomeric compression or strip seal joint systems shown on the plans.

### **Materials:**

- (a) Steel Locking Edge Rails for the Preformed Elastomeric Strip Seal System. The steel locking edge rails shall be either a one-piece extrusion (rolled section) or a combination of extruded and stock plate, shop welded according to Section 505. All steel shall be AASHTO M270, Grade 250 (Grade 36) minimum. The locking portion of the steel edge rail shall be extruded, with a cavity, properly shaped to allow the insertion of the strip seal gland and the development of a mechanical interlock. The top edge of the steel edge rails shall not contain any horizontal projections.
- (b) Steel Plates for the Preformed Elastomeric Compression Seal System. The plates and bars or other structural shapes provided as edge reinforcement at joints, between adjacent spans, shall be accurately fabricated in the shop to conform to the section of the concrete floor or sidewalk. The fabrication shall conform to Section 505. The plates shall be held securely in the correct position during the placing of the concrete.
- (c) Anchor Studs. The steel locking edge rails or plates shall contain anchor studs and/or anchor plates of the size shown on the plans for the purpose of firmly anchoring the expansion joint system in either portland cement concrete or polymer concrete, depending on the application. The anchor studs shall be according to Article 1006.32 and shall be installed in the shop prior to painting or galvanizing.
- (d) Preformed Elastomeric Compression Seals. The Preformed Elastomeric compression seal shall be according to AASHTO M220. The compression seal shall be of the size and shape shown on the plans.
- (e) Preformed Elastomeric Strip Seal. The elastomeric gland shall meet the physical requirements of ASTM D5973. The gland material shall have a shallow "v" profile and shall contain "locking ears" that, when inserted in the steel locking edge rails, forms a mechanical interlock. The elastomeric gland shall be of an appropriate size to accommodate the rated movement specified on the plans.
- (f) Adhesive/Lubricant. The adhesive/lubricant shall comply with the requirements of ASTM D4070.



Construction:

- (a) Steel Plates or locking edge rails. After fabrication the steel plates or locking edge rails shall be given one shop coat of the paint specified for structural steel. The steel components may be hot dip galvanized according to AASHTO M111 and ASTM A385 in lieu of shop painting at the manufacturer's option. The steel components of the joint system shall be properly aligned and set prior to pouring the anchorage material. For expansion joints, the joint opening shall be adjusted according to the temperature at the time of placing so that the specified opening will be secured at a temperature of 10 °C (50 °F).

The joint opening for each 10 m (100 ft.) of bridge between the nearest fixed bearings each way from the joint shall be reduced 1 mm (1/8 in.) from the amount specified, for each 8 °C (15 °F) the temperature at the time of placing exceeds 10 °C (50 °F) and increased 1 mm (1/8 in.) from the amount specified, for each 8 °C (15 °F) the temperature at the time of placing is below 10 °C (50 °F).

- (b) Preformed Elastomeric Strip Seal. Once the anchoring material has fully cured according to specifications, preparation for the placement of the gland can begin.

(1) Surface Preparation. The cavity portion of the locking edge rails must be cleaned of all foreign material prior to placement of the strip seal. Surface rusting shall be removed and any bare steel touched up according to Article 506.05. The cavity shall be cleaned of debris using compressed air with a minimum pressure of 620 kPa (90 psi). The air compressor shall be equipped with traps to prevent the inclusion of water and/or oil in the air line. Any oil left on the surface of the steel extrusion at this stage shall be removed using a solvent recommended by the strip seal manufacturer. Once the surface preparation has been completed, the steel extrusion cavities must be kept clean and dry until the strip seal is placed.

(2) Placement of Elastomeric Strip Seal. The placement of the strip seal will only be permitted when the steel locking edge rail cavities are in a clean and dry state and the ambient air and steel substrate temperature are above the minimum temperature recommended by the strip seal manufacturer. Prior to inserting the strip seal in the steel retainer cavities, the "locking ears" portion of the seal shall be coated with the approved adhesive/lubricant. Only about 1.5 m (5 ft) of gland should be coated at a time to prevent the lubricant/adhesive from drying prior to insertion into the cavities of the steel locking edge rails. After each section is coated, the coated portion of the seal should be inserted in the steel locking edge rail cavities using tools and procedures recommended by the strip seal manufacturer. Under no circumstances shall any uncoated "locking ears" be permitted in the joint.

- (c) Preformed Elastomeric Compression Seal. Once the anchoring material has fully cured according to specifications, preparation for the placement of the gland can begin.

(1) Surface Preparation. The steel plates must be cleaned of all foreign material prior to placement of the compression seal. Surface rusting shall be removed and any bare steel touched up according to Article 506.05. Once the surface preparation has been completed, the steel plates must be kept clean and dry until the compression seal is placed.

(2) Placement of Elastomeric Compression Seal. The seals shall be installed by suitable hand or machine tools and thoroughly secured in place with the approved adhesive

which shall cover both sides of the seals over the full area in contact with the sides of the joint. The adhesive may be applied to the sides of the joint or the seals or both. The seals shall be installed in a compressed condition and shall at all times be below the level of the deck surface as shown on the plans. The seals shall be in one continuous piece for the full length of the joint. The continuous piece for installation shall not have more than one manufacturer's butt splice within its length. If the splice is torn or damaged it shall be repaired, prior to installation, using the manufacturer's recommended adhesive. Temperature limitations of the adhesive, as specified by the manufacturer, shall be observed.

- (d) End Treatment. The end treatment for curbs, parapets and sidewalks shall be as detailed on the plans and as recommended by the manufacturer of the joint system.
- (e) Technical Support. The manufacturer shall supply technical support during surface preparation and the installation of the entire joint system.

Method of Measurement: The completed joint system will be measured in meters (feet) along the centerline of the joint.

Basis of Payment: The expansion joint system(s), measured as specified, will be paid for at the contract unit price per meter (foot) for BRIDGE EXPANSION JOINT SYSTEM, of the design movement specified. These prices shall be payment in full for all labor, materials, equipment, and manufacturer's technical support required for surface preparation and joint installation.

#### **ELASTOMERIC BEARING PADS (SPECIAL)**

Description. This work shall include the furnishing and installation of elastomeric bearing pads.

Materials. Materials for elastomeric bearing pads shall be provided in accordance with Section 1083.02 of the Standard Specifications.

Method of Measurement. The elastomeric bearing pads will be measured for payment in square feet in place.

Basis of Payment. The work under this item will be paid for at the contract unit price per square foot for ELASTOMERIC BEARING PADS (SPECIAL).

#### **LOW FLOW WALK (SPECIAL)**

Description: This item of work will consist of construction of the Low Flow Walk (Special) as shown on the Plans, described herein and as directed by the Engineer. The work shall be in accordance with the applicable portions of Sections 201, 209, 281, 282, 502, 503, 508 and 584 of the Standard Specifications.

Materials: The following material requirements shall be used for the Low Flow Walk (Special):

- Concrete shall conform to the requirements of Section 503 of the Standard Specifications.
- Porous Granular Backfill shall conform to the requirements of Section 209 of the Standard Specifications. Gradation shall be CA-11.
- Filter Fabric shall meet the requirements of Article 1080.03 of the Standard Specifications.
- Reinforcement Bars shall conform to Section 508 of the Standard Specifications. Bars shall be epoxy coated.
- Riprap shall meet the requirements of Article 1005.01 of the Standard Specifications. Gradation shall meet the requirements of Article 1005.01 of the Standard Specifications. Gradation shall be RR4.

Construction Requirements: The Contractor shall complete the following tasks in association with the construction of the Low Flow Walk (Special) :

- Install temporary sheeting or dikes to divert water from the excavation in front of the Low Flow Walk (Special) along full length.
- Excavate for Low Flow Walk Foundation down to the elevation shown on the Plans.
- Construct foundation slab on suitable material.
- Install filter fabric, porous granular backfill and riprap.
- Remove temporary sheeting.
- Construct low flow walk top slab.
- Restore embankment.

The Contractor's attention is directed to the requirements that various utilities, including storm sewers and gas line are located within the Low Flow Walk (Special) construction area and under the foundation. The Contractor is responsible for the structural integrity of these utilities during the construction.

Method of Measurement: This item of work will be measured on a lump sum basis for Low Flow Walk (Special).

Basis of Payment: This item of work will be paid for at the contract lump sum price for LOW FLOW WALK (SPECIAL). The unit bid price for Low Flow Walk (Special) will include all temporary sheeting, dikes or other satisfactory earth retention system, excavation, dewatering, concrete, reinforcement bars, riprap, porous granular embankment, filter fabric and all other labor, equipment, tools and incidentals necessary to complete this item of work as specified on the Plans, described herein and as directed by the Engineer.

## **FURNISHING, INSTALLING AND STRESSING POST-TENSIONING TENDONS**

### **DESCRIPTION:**

This work shall consist of furnishing, installing, testing, stressing and grouting prestressing steel in accordance with the details shown on the Contract Plans, portions of Sections 500, 503, 504, and 508 of the Standard Specifications and the requirements of these Special Provisions.

It shall also include the furnishing and installing of any appurtenant items necessary for the particular prestressing system used, including but not limited to, anchorage assemblies, additional reinforcing bars required to resist stresses caused by anchorage assemblies, ducts, vents, inlets, outlets, and grout used for pressure grouting of the ducts.

The Contractor may propose for consideration, certain variations from the prestressing systems shown in the Contract Plans. Any prestressing system proposed by the Contractor shall comply with the following:

1. Materials and devices used in the prestress system shall conform to the requirements of the following Materials Section of these Special Provisions.
2. The net compressive stress in the concrete after all losses is at least as large as that provided by the system shown on the Contract Plans.
3. The distribution of individual tendons at each section generally conforms to the distribution shown on the Contract Plans.
4. The ultimate strength of the structure with the proposed post-tensioning system shall meet the requirements of Section 9 of the AASHTO Standard Specifications for Highway Bridges, 16th Edition, 1996 including interim revisions thru 2002.
5. Stresses in the concrete and prestressing steel at all sections and at all stages of construction shall meet the requirements of the Design Criteria noted on the Contract Plans.
6. Compliance with all the provisions of the Design Criteria, as noted on the Contract Plans.
7. The Contractor fully redesigns and details, as required, all the elements where the alternate prestressing system is proposed to be used.
8. The Contractor submits complete shop drawings including the prestressing scheme and system, reinforcing steel, concrete cover, and design calculations (including short and long term prestress losses) for the Engineer's review.
9. AASHTO M203M (ASTM A416M) Grade 1860, low-relaxation 13 mm diameter strand and 15 mm diameter strand may be substituted for each other on an equal force basis within any tendon size shown by the designer.

WORKING DRAWINGS SUBMITTALS:

The Contractor shall submit detailed shop drawings in accordance with Division II Section 10 of the AASHTO Standard Specifications for Highway Bridges, Sixteenth Edition, 1996 interim revisions thru 2002, which include, but are not limited to:

- A. A complete description of, and details covering, each of the prestressing systems to be used for permanent and temporary tendons.

This shall include:

1. Designation of the specific prestressing steel, anchorage devices, bar couplers, duct material and accessory items.
2. Properties of each of the components of the prestressing system.
3. Details covering assembly of each type of prestressing tendon.
4. Equipment to be used in the prestressing sequence.
5. Procedure and sequence of operations for prestressing and securing tendons.
6. Procedure for releasing the prestressing steel elements.

- B. A table detailing the prestressing jacking sequence, jacking forces and initial elongations of each tendon at each stage of erection for all prestressing.

Along with the table, calculations shall be submitted to substantiate the prestressing system and procedures to be used including stress-strain curves typical of the prestressing steel to be furnished and seating losses. These calculations shall show a typical tendon force after applying the expected friction coefficient, and anticipated losses including anchor set losses.

Elongation calculations shall be revised when necessary to properly reflect the modulus of elasticity and nominal area as furnished by the Manufacturer for the lot of steel being tensioned. Elongation calculations shall also be adjusted, as necessary, based upon the actual coefficient of friction measured and calculated by an in-place friction test.

- C. Complete details of the anchorage system for prestressing including certified copies of the reports covering tests performed on prestress anchorage devices as required in the following Materials Section B, and details for any reinforcing steel needed due to stresses imposed in the concrete by anchorage plates.
- D. For the operation of grouting prestressing tendons, the materials and proportions for grout, as described in the following Materials Section G. The details of equipment for mixing and placing grout and methods of mixing and placing grout as described in Construction Section I.
- E. Complete details of the apparatus and method to be used by the Contractor for the test required by the following Materials Sections F.1 and F.2, including the proposed tendons to be tested.

MATERIALS:

The materials to be incorporated into work covered by this Section shall conform to the requirements set out herein.

- A. **Prestressing Steel.** Unless otherwise noted on the Contract Plans, strand shall be uncoated, Grade 1860, low-relaxation seven-wire strand conforming to the requirements of AASHTO M203M (ASTM A416M).
- B. **Prestress Anchorages.** All prestressing steel shall be secured at the ends by means of permanent type anchoring devices. Prestress anchorages shall develop at least 100 percent of the minimum specified ultimate tensile strength of the prestressing steel. Each anchor shall be protected with a permanent non-metallic grout cap fastened to the anchor plate.

Testing of anchorage devices shall be performed using samples representing the type of prestressing steel and concrete strength to be used on the project. The test specimen shall be assembled in an unbonded state and, in testing, the anticipated anchor set shall not be exceeded. Certified copies of test results for the anchorage system shall be supplied to the Engineer. The anchorage system shall be so arranged that the prestressing force in the tendon may be verified prior to the removal of the stressing equipment.

The Engineer will immediately stop the use of two part wedges that show any sign of slippage or failure to grip the tendon without exceeding the anticipated set, and require the use of acceptable alternative three part wedges for anchoring post-tensioning strands at no additional cost to the Department.

For tendon anchorages, the design and furnishing of any reinforcement (in addition to the reinforcement shown on the Contract Plans) which is needed to resist bursting and splitting stresses imposed on the concrete by the proposed anchorage system shall be the responsibility of the Contractor at his expense

Prestress anchorage devices shall effectively distribute prestressing loads to the concrete and shall meet the following requirements:

1. Average bearing stress in the concrete created by the bearing plate shall not exceed the values as determined by the following equations:

During jacking:

$$f_{cp} = 0.8f'_{ci} \sqrt{\frac{A'_b}{A_b} - 0.2} \leq 1.25f'_{ci}$$

After jacking:

$$f_{cp} = 0.6f'_c \sqrt{\frac{A'_b}{A_b} - 0.2} \leq 1.25f'_c$$

Where:

- $f_{cp}$  = permissible compressive stress  
 $f'_{ci}$  = compressive strength of concrete at time of jacking  
 $f'_c$  = compressive strength of concrete (28 days)  
 $A'_b$  = maximum area of the portion of the concrete anchorage surface that is geometrically similar to and concentric with the area of the anchorage.  
 $A_b$  = bearing area of the anchorage

2. Bending stresses in the plates or assemblies induced by the pull of the prestressing steel shall not exceed the yield point of the material or cause visible distortion of the anchorage plate when 100% of the ultimate strength of the tendon is applied. The Contractor shall provide the Engineer with certified test reports from an approved independent testing laboratory, verifying compliance with this requirement, for each type and/or size of anchoring device.

Anchorage devices not meeting either or both of the above requirements (1 and 2) may be accepted based upon previously approved usage in the State of Illinois or on the basis of new or previous tests performed in accordance with and meeting the requirements of Division II, Section 10.3.2.3 "Special Anchorage Device Acceptance Test" of the AASHTO Standard Specifications, Sixteenth Edition, 1996 and all interims thru 2002. Such testing shall be performed at no cost to the Department. In such cases, incorporate any additional confinement reinforcement or modifications to existing reinforcement required for satisfactory performance of the anchorage devices in the structure at no additional cost to the Department.

- C. **Ducts.** All duct material shall be sufficiently rigid to withstand loads imposed during placing of concrete and internal pressure during grouting while maintaining its shape, remaining in proper alignment and remaining watertight.

The duct system, including splices and joints, shall effectively prevent entrance of cement paste or water into the system and shall effectively contain pressurized grout during grouting of the tendon. The duct system shall also be capable of withstanding water pressure during flushing of a duct in the event the grouting operation is aborted.

Coupling and transition fittings for ducts shall be consistent with the specified duct material and shall have sufficient strength to prevent distortion or displacement of the ducts during concrete placement. All seams or joints shall be sealed with heat-shrink wrapping to prevent the intrusion of cement paste.

The interior diameter of ducts for single strand, bar or wire tendons shall be at least 6 mm greater than the nominal diameter of the tendon. For multiple bar or strand tendons, the inside cross-sectional area of the duct shall be at least 2.0 times the net area of the prestressing steel with one exception: where tendons are to be placed by the pull-through method, the duct area shall be at least 2.5 times the net area of the prestressing steel.

The size of ducts shall not exceed 0.4 times the least gross concrete thickness at the duct.

1. Duct Material Properties. Except as otherwise noted on the Contract Plans, the type of duct material used shall be corrugated plastic polyethylene or polypropylene duct.
  - a. Corrugated Polyethylene Plastic. Plastic duct shall be made of high-density polyethylene material and shall conform to the requirements of ASTM D3350 with a cell classification range of 345433C.
  - b. Corrugated Polypropylene Plastic. Plastic duct shall be made of high-density polypropylene conforming to ASTM D4101, cell classification range PP210B43542 to PP210B65542.

The plastic material shall not react with concrete or enhance corrosion of prestress steel and shall be free of water-soluble chloride. Corrugated plastic duct shall be corrugated with a spiral having a pitch not less than 1/10 of the radius of the duct. The minimum wall thickness shall be  $2 \text{ mm} \pm 0.25 \text{ mm}$ .

Corrugated plastic duct shall be designed so that a force equal to 40 percent of the ultimate tensile strength of the tendon will be transferred through the duct into the surrounding concrete in a length of 0.76 meters. Twelve static pull out tests shall be conducted to determine compliance of a duct with the force transfer requirement. If ten of these tests exceed the specified force transfer, the duct is acceptable. The Contractor shall provide to the Engineer certified test reports verifying that the duct meets these Special Provisions requirements in regard to force transfer.

2. Minimum Radius of Curvature. Tendon ducts shall preferably be installed with a radius of curvature of 6.1 meters or more. Ducts with sharper curvature down to a minimum of three meters shall have confinement reinforcement detailed to tie the duct into the concrete. Duct curvature with radii less than three meters may be approved by the Engineer based on review of test data. The confinement reinforcement shall be proportioned in accordance with Section D16.3 of the AASHTO Guide Specifications for Design and Construction of Segmental Concrete Bridges, 2<sup>nd</sup> Edition.

**D. Testing and Sampling.** All testing shall be done in accordance with ASTM Specifications.

For each manufacturer of prestressing strand, bar, wire, bar and/or tendon couplers, and anchorage assemblies to be used on the project, the Contractor shall submit a certification stating the manufacturer's minimum guaranteed ultimate tensile strength of the sample furnished.

The Contractor shall also allow the Engineer to sample the following materials, selected at the plant or jobsite, from the prestressing steel used for post-tensioning operations well in advance of anticipated use:

1. For strands: One randomly selected sample, 1.5 m long, per manufacturer, per size of strand, per shipment, with a minimum of one sample for every ten reel delivered.



2. For bars: Three randomly selected samples, 1.5 m long, per manufacturer, per size of bar, per heat of steel, with a minimum of one sample per shipment.
3. For permanent couplers: Three units of 0.5 m lengths of bar/tendon, each equipped with one coupler and fabricated to fit the coupler, per manufacturer, per heat of coupler steel.
4. For anchorage assemblies: Two samples of each size, per manufacturer, per heat of steel.

One of each of the samples furnished to represent a lot will be tested. The remaining sample(s), properly identified and tagged, will be stored by the Engineer for future testing in the event of loss or failure of the component represented to meet minimum strength requirements. For acceptance of the lot represented, test results must show that 100% of the guaranteed ultimate tensile strength has been met.

- E. **Manufacturer's Lots.** The manufacturer of prestressing steel, prestress anchorages and bar couplers shall assign an individual number to each lot of strand, wire, bar or devices at the time of manufacture. Each reel, coil, bundle or package shipped to the project shall be identified by tag or other acceptable means as to Manufacturer's Lot number. The Contractor shall be responsible for establishing and maintaining a procedure by which all prestressing materials and devices can be continuously identified with the Manufacturer's Lot number. Items which at any time cannot be positively identified as to lot number shall not be incorporated into the work.

Low-relaxation strand shall be clearly identified as required by AASHTO M203M (ASTM A416M). Any strand not so identified will not be acceptable.

The Contractor shall furnish manufacturer's certified reports covering the tests required by these Special Provisions. A certified test report stating the guaranteed minimum ultimate tensile, yield strength, elongation and composition shall be furnished for each lot of prestressing steel. When requested, typical stress-strain curves for prestressing steel shall be furnished. A certified test report stating strength when tested using the type prestressing steel to be used in the work shall be furnished for each lot of prestress anchorage devices.

- F. **Testing of Prestressing Tendons.** The Contractor shall perform certain testing of prestressing tendons as specified herein:

1. In-place Friction Test of Tendons. This test is intended to demonstrate that the friction characteristics, losses and resulting tendon forces are in agreement with the design assumptions.

For the purpose of verifying friction loss the Contractor shall test in place, the first draped or horizontally curved tendon installed of each size and type which is at least 15 meters long. Size is defined as the size and number of strands, bars or wires in each tendon. Type is defined as to both prestressing and duct material and to the tendon function within the structure. Function is the general category of the tendon whether it is a cantilever tendon, continuity tendon, draped external tendon or continuous profiled tendon passing through one or more spans, etc. In

this respect, the function of two or more tendons may be the same even though their actual profiles and lengths differ.

The test procedure shall consist of stressing the tendon at an anchor assembly with a load cell at the dead end. The load cell may not be substituted with a second jack. The test specimen shall be tensioned to 80 percent of ultimate in 8 equal increments and de-tensioned in 8 equal increments. For each increment and decrement, the gauge pressure, elongation and load cell force shall be recorded. Take into account any wedge seating in both the live end (i.e., back of jack) and the dead end (i.e., back of load cell) and of any friction within the anchorages, wedge plates and jack as a result of slight deviations of the strands through these assemblies. For long tendons requiring multiple jack pulls with intermediate temporary anchoring, keep an accurate account of the elongation at the jacking end allowing for intermediate wedge seating and slip of the jacks' wedges.

Conduct the test using the lubricants required, if any, to meet the expected friction coefficient.

If the elongations fall outside the  $\pm 5\%$  range of the expected friction coefficients, the contractor shall assume responsibility to investigate the reason and make revisions to post-tensioning operations so the final tendon forces are in agreement with the Contract Plans.

In reconciling theoretical and actual elongations, the expected friction and wobble coefficients shall not be varied by more than  $\pm 10\%$ . A significant shortfall in elongations is indicative of poor duct alignments and/or obstructions. The Contractor shall submit proposed methods to correct or compensate for out-of-tolerance elongations for review and approval by the Engineer at no additional cost to the Department.

The Engineer will require one successful friction test for each type and size of tendon for the project.

If there are irreconcilable differences between forces and elongations, or other difficulties during the course of routine stressing operations, the Engineer may require additional in-place friction tests.

The apparatus and methods used to perform the test must be submitted to the Engineer for approval. Tests shall be conducted in the Engineer's presence.

The originator of the stressing and elongation calculations shall assume responsibility for correction or adjustment of elongations from the friction test results.

2. Dynamic Testing of Unbonded Tendons. Unbonded tendons are defined as tendons that are located essentially external to the concrete. For unbonded superstructure tendons, the Contractor shall perform two dynamic tests on a representative specimen and the tendon shall withstand, without failure, 500,000 cycles from 60 percent to 66 percent of its minimum specified ultimate strength. In the second test the tendon shall withstand without failure 50 cycles from 40 percent to 80 percent of its minimum specified ultimate strength. The period of

each cycle involves the change from the lower stress level to the upper stress level and back to the lower. The specimen used for the second dynamic test need not be the same used for the first dynamic test.

Systems utilizing multiple strands, wires, or bars shall be tested utilizing a test tendon of full size. The test tendon shall duplicate the behavior for the full size tendon and generally shall not have less than 10 percent of capacity for the full size tendon.

In lieu of the dynamic testing, the Contractor may submit data from prior test. Acceptance of data from prior test is subject to the approval of the Engineer.

- G. Grout for Tendons.** The grout to be used to fill the voids in tendons shall consist of a pre-packaged commercial cement-based grout mixture meeting the requirements of these Special Provisions.

The following pre-packaged, commercial grouts are acceptable:

- Master Builders "Masterflow 1205 Cable Grout"
- Sika Corporation "Sika Cable Grout"
- EuclidChemical Co "Euco Cable Grout PTX"
- Diwydag System "Dyna Grout"
- Approved equal

1. Grout Components. The water used in the grout shall be potable, clean, and free of injurious quantities of substances known to be harmful to Portland cement or post-tensioning steel.

The grout shall contain no aluminum powder or components.

2. Grout Properties. The bags shall be stamped with date of manufacture, lot number and mixing instructions. A copy of the Quality Control Data Sheet for each lot number and shipment sent to the job site shall be provided to the Contractor by the grout supplier and furnished to the Engineer. Materials with a total time from manufacture to usages in excess of six months shall be tested and certified by the supplier that the product meets the QC Control Specifications before use or the material shall be removed and replaced.

Prior to beginning grouting operations, the Contractor shall furnish to the Engineer, the results of tests performed by a laboratory approved by the Engineer demonstrating that the grout mixture he proposes to use meets the requirements of these Special Provisions. This information shall include a graph relating compressive strength of the grout to age, covering ages from 24 hours to 28 days.

Any change of material or material sources requires new testing and certification of the conformance of the grout with these Special Provisions.

3. Required Properties and Laboratory Test.

Grout shall meet the following physical properties:

Property	Test Value	Test Method
Compressive Strength (average of 3 Cubes)	Min. 38 MPa @ 7 days & 48 MPa @ 28 days	ASTM C942*
Initial Set of Grout	Min. 3 hours Max. 12 hours	ASTM C953*
Fine Aggregate (if utilized)	99% Passing the No. 50 Sieve (300 micron)	ASTM C136** (non-reactive per Appendix)

Property	Test Value	Test Method
Permeability @ 28 days	Max. 2500 coulombs at 30V for 6 hours	ASTM C1202
Wick Induced Bleed Test	0.0% after 3 hours	ASTM C940***
Volume Change	0% @ 24 hours and 0.2% maximum @ 28 days	ASTM C1090****
Fluidity Tets Efflux Time from Flow Cone	Min. 20 seconds immediately after mixing  Max. 30 seconds, 30 minutes after mixing with re-mixing for 30 sec.	ASTM C939
Total Chloride Ions	Max 0.08% by weight Of cementitious material	ASTM C1152
Wet Density - Laboratory	Report Max. and Min. obtained test value Kg/l	ASTM C185
Wet Density - Field	Report Max. and Min. obtained test value Kg/l	ASTM C138

\* The test specimen shall be prepared using the materials and in the proportions which are to be used in production of grout.

\*\* Use ASTM C117 procedure modified to use a #50 sieve. Determine the percent passing the #50 sieve after washing the sieve.

\*\*\* Modified ASTM C940:

(a) Condition dry ingredients, mixing water, prestressing strand and test apparatus overnight at 21 to 25°C.

(b) Insert 800 ml of mixed condition grout with conditioned water into the 1,000 ml graduate cylinder. Mark the level of the top of the grout.

(c) Use a wick made of a 500 mm length of ASTM A416 seven wire 12.7 mm diameter strand. Wrap the strand with 50 mm wide duct or electrical tape at each end prior to cutting to avoid splaying of wires when it is cut. Degrease (with acetone or hexane solvent) and wire brush to remove any surface rust on the strand before temperature conditioning.

(d) Insert completely the wire strand (15 mm diameter) into the 1,000 ml graduate. Center and fasten the strand so it remains essentially parallel to the vertical axis of the cylinder. Mark the level of the top of the grout.

(d) Store the mixed grout at the temperature range listed above in (a).

(e) Measure the level of the bleed water every 15 min. for the first 1 hr and then hourly afterward for 4 hrs.

(f) Calculate the bleed water, if any, at the end of the three hour test period and the resulting expansion per the procedures outlined in ASTM C940, with the quantity of bleed water expressed as a % of the initial grout volume. Note if the bleed water remains above or below the top of the original grout height. Note if any bleed water is absorbed into the specimen during the test.

\*\*\*\* Modify ASTM C1090 to include verification at both 24 hours and 28 days.

#### 4. Accelerated Corrosion Test Method (ACTM)

Perform the ACTM as outlined in Appendix B of the "Specification for Grouting of Post-Tensioning Structures" published by the Post-Tensioning Institute. Report the time to corrosion for both the grout being tested and the control sample using a 0.45 water-cement ratio neat grout.

A grout that shows a longer average time to corrosion than the control sample and a time to corrosion that exceeds 1,000 hours is considered satisfactory.

### CONSTRUCTION:

**A. Post-Tensioning Personnel.** The Contractor shall designate a Technician who will be responsible for the post-tensioning during the term of the project, and any others the Contractor or Engineer may deem necessary. The Contractor shall submit Technician's resume for Engineer approval. The Contractor's designated Technician shall be:

1. Skilled in the use of post-tensioning system, equipment and hardware to be used on the project.
2. Knowledgeable in required field stressing calculations to insure tendons are stressed in accordance with approved shop drawings.
3. Present on the project during the installation of the post-tensioning system, during all stressing operations, and during the grouting operations.

The responsible representative from the post-tensioning system supplier shall also be present during the stressing of the first three permanent tendons as a minimum.

**B. Protection of Prestressing Steel.** All prestressing steel shall be protected against physical damage at all times from manufacture to grouting or encasing in concrete. Prestressing steel that has sustained physical damage at any time shall be rejected. Any reel that is found to contain broken wires shall be rejected and the reel replaced.

Prestressing steel shall be packaged in containers or shipping forms for protection of the steel against physical damage and corrosion during shipping and storage. A corrosion

inhibitor, which prevents rust or other results of corrosion, shall be placed in the package or form, or shall be incorporated in a corrosion inhibitor carrier type packaging material. Only after submittal to and approval by the Engineer, may a corrosion inhibitor be applied directly to the steel. The corrosion inhibitor shall have no deleterious effect on the steel or concrete or bond strength of steel to concrete. The inhibitor shall be water-soluble. The corrosion inhibitor, the amount and time of initial application and the frequency of reapplication shall be subject to the approval of the Engineer. Packaging or forms damaged from any cause shall be immediately replaced or restored to original condition.

The prestressing steel shall be stored in a manner which will at all times prevent the packing material from becoming saturated with water and allow a free flow of air around the packages. If the useful life of the corrosion inhibitor in the package expires, it shall immediately be rejuvenated or replaced.

At the time the prestressing steel is installed in the work, it shall be free from loose rust, loose mill scale, dirt, paint, oil, grease or other deleterious material. Removal of tightly adhering rust or mill scale will not be required. Prestressing steel, which has experienced rusting to the extent that it exhibits pits visible to the naked eye, shall not be used in the work.

The shipping package or form shall be clearly marked with the heat number and with statement that the package contains high-strength prestressing steel, and care is to be used in handling. The type and amount of corrosion inhibitor used, the date when placed, safety orders and instructions for use shall also be marked on the package or form.

When the Contract Plans provide for prestressing steel to be installed in one unit with a length of prestressing steel left projecting to be threaded into another unit during erection, all of the prestressing shall be protected from corrosion from immediately after it is installed in the first unit until the tendon is grouted in the second unit as provided below.

All anchorages, end fittings, couplers, and exposed tendons that will not be encased in concrete or grout in the completed work shall be permanently protected against corrosion.

When corrosion protection of in-place prestressing steel is required, a corrosion inhibitor that prevents rust or other results of corrosion shall be applied directly to the prestressing steel. The corrosion inhibitor shall have no deleterious effect on the prestressing steel or grout or bonding of the prestressing steel to the grout. The inhibitor shall be water-soluble. The corrosion inhibitor, the amount and time of initial application, and the frequency of reapplication shall be subject to the Engineer's approval.

The corrosion inhibitor shall consist of a Vapor Phase Inhibitor (VPI) powder conforming to the provisions of Federal Specification MIL-P-3420F-87 or as otherwise approved by the Engineer. When properly applied, the powder is absorbed onto the metal surfaces to form an invisible film. This film passivates the metal and inhibits corrosion. VPI powder contains dicyclohexylamine nitrite and is moderately toxic.

The Contractor shall use the manufacturer recommendations when applying the powder. The Contractor shall include provisions for placing VPI powder on the working drawings.

- C. Placement of Ducts.** The ducts shall be rigidly supported at the proper locations in the forms by ties to reinforcing steel that are adequate to prevent displacement in all directions during concrete placement. Supplementary support bars shall be used where needed to maintain proper alignment of the duct.

Round internal ducts shall be rigidly supported by ties to reinforcing steel at a maximum spacing of 600 mm. Flat internal ducts shall be rigidly supported by ties to reinforcing steel at a maximum spacing of 600 mm if the strand is pre-loaded prior to placing concrete and 300 mm if not. Any additional mild reinforcing required to support post-tensioning ducts shall be detailed and supplied by the Contractor.

If conflicts exist between the reinforcement and post-tensioning duct, in general, the position of the post-tensioning duct shall prevail and the reinforcement shall be adjusted locally. The Contractor shall submit proposed reinforcement adjustment to the Engineer for approval. Any additional reinforcement required to resolve the conflict shall be provided at no extra cost by the Contractor.

Joints between sections of duct shall be coupled with positive connections that do not result in angle changes at the joints. The connections shall be sealed with heat-shrink wrapping to prevent the intrusion of cement paste.

After placing of ducts and reinforcement and forming is complete, an inspection shall be made to locate possible duct damage. All unintentional holes or openings in the duct shall be repaired prior to concrete placing at the Contractor's expenses.

Grout openings and vents shall be securely anchored to the duct and either to the forms or to reinforcing steel to prevent displacement during concrete-placing operations.

After installation in the forms, the ends of ducts shall at all times be sealed to prevent entry of water and debris.

All ducts or anchorage assemblies for permanent post-tensioning shall be provided with vent pipes or other suitable connections at each end and at each side of couplers for the injection of grout after post-tensioning. Ducts shall be vented at the high points of the post-tensioning steel profile when there is more than a 150 mm variation in the vertical position of the duct and the tendon length exceeds 122 m. Where freezing conditions can be anticipated prior to grouting, drains shall be installed at the low points of all tendons to prevent the accumulation of water.

Vents shall be 13 mm minimum diameter plastic pipes. All connections to ducts shall be made with plastic structural fasteners. Waterproof tape shall be used at all connections including vent and grouting pipes. Plastic components shall not react with the concrete or enhance corrosion of the post-tensioning steel, and shall be free of water-soluble chlorides.

The vents shall be mortar tight, taped as necessary, and shall provide means for injection of grout through the vents and for sealing the vents. Ends of plastic vents shall be removed to the surface of the concrete after the grout has set.

All grout injection and vent pipes shall be fitted with positive mechanical shut-off valves. Vents and injection pipes shall be fitted with valves, caps or other devices capable of withstanding the pumping pressures.

All end anchorages shall be protected with a permanent non-metallic grout cap fastened to the anchor plate.

- D. Tolerances.** The tolerance on the installed location of the tendons shall be plus or minus 6 mm at any point.

The entrance and exit angles of tendon paths at anchorages and/or at faces of concrete shall be within  $\pm 3$  degrees ( $\pm 5\%$ ) of desired angle measured in any direction.

Angle changes at duct joints shall not be greater than  $\pm 3$  degrees ( $\pm 5\%$ ) in any direction.

Anchorage shall be located within  $\pm 6$  mm of desired position laterally and  $\pm 25$  mm along the tendon except that minimum cover requirements to ends of cut off tendons and anchor components must be maintained.

Position anchorage confinement reinforcement in the form of spirals, multiple U shaped bars or links, to start within 13 mm of the back of the main anchor plate, providing the anchorage is to be encased or sealed later in the construction, and properly center around the duct.

- E. Placement of Prestressing Steel.** Prior to installation of ducts, the Contractor shall determine the most suitable method of feeding prestressing steel into the ducts. Long, draped tendons may necessitate pre-assembly of the prestressing steel in the ducts prior to duct placement or feeding of prestressing steel into the in-place ducts prior to draping of the tendon and casting of the concrete.

All prestressing steel pre-assembled in ducts and installed prior to the placement of concrete shall be accurately placed and held in position during concrete placement.

When the prestressing steel is installed after the concrete has been placed, the Contractor shall demonstrate to the satisfaction of the Engineer that the ducts are free of water and debris immediately prior to installation of the steel. The total number of strands in an individual tendon may be pulled into the duct as a unit, or the individual strand may be pulled or pushed through the duct. Anchorage devices or block-out templates for anchorages shall be set and held so that their axis coincides with the axis of the tendon and anchor plates are normal in all directions to the tendon.

- F. Protection of Steel after Installation.** Prestressing steel installed in members prior to placing and curing of the concrete, or installed in the duct but not grouted within the time limit specified below, shall be continuously protected against rust or other corrosion by means of a corrosion inhibitor placed in the ducts or directly applied to the steel. The prestressing steel shall be so protected until grouted or encased in concrete. Prestressing steel installed and tensioned in members after placing and curing of the concrete and grouted within the time limit specified below will not require the use of a corrosion inhibitor of the type described in Construction Section B, and rust that may form during the interval between tendon installation and grouting will not be cause for rejection of the steel.



The permissible interval between tendon installation and grouting without the use of a corrosion inhibitor for various exposure conditions shall be taken as follows:

- Very Damp Atmosphere or over saltwater      7 days  
(Humidity  $\geq$  70 percent)
- Moderate Atmosphere      15 days  
(40 percent < Humidity < 70 percent)
- Very Dry Atmosphere      20 days  
(Humidity  $\leq$  40 percent)

After tendons are placed in ducts, the openings at the ends of the ducts shall be sealed to prevent entry of moisture.

When steam curing is used, unless anchorage systems mandate its installation, steel for post-tensioning shall not be installed until the steam curing is completed.

Whenever electric welding is performed on or near members containing prestressing steel, the welding ground shall be attached directly to the steel being welded. All prestressing steel and hardware shall be protected from weld spatter or other damage.

**G. Placement of Anchorage Hardware.** The Contractor is responsible for the proper placement of all materials according to the Contract documents and the requirements stipulated by the anchorage device supplier. The Contractor shall exercise all due care and attention in the placement of anchorage hardware, reinforcement, concrete, and consolidation of concrete in anchorage zones. Modifications to the local zone details verified under provisions of Division I Article 9.21.7.3 of the AASHTO Standard Specifications for Highway Bridges 16th Edition 1996 including interim revisions thru 2002, and by testing as specified herein shall be approved by both the Engineer and the anchorage device supplier.

#### **H. Post-tensioning Operations.**

1. **Stress in Tendons.** The design of the structure is based on the assumed friction and wobble coefficient shown in the Contract Plans.

The post-tensioning forces shown are theoretical and do not include losses in the system or thermal affects.

All post-tensioning shall be tensioned by means of hydraulic jacks so that the force of the prestressing steel shall not be less than the value shown on the approved shop drawings. The maximum temporary tensile stress (jacking stress) in prestressing steel shall not exceed 80 percent of the specific minimum ultimate tensile strength of the prestressing steel. The prestressing steel shall be anchored at initial stresses in a way that will result in the ultimate retention of permanent forces of not less than those shown on the approved shop drawings, but in no case shall the initial stress at the anchorage, after anchor set, exceed 70 percent of the specified minimum ultimate tensile strength of the prestressing steel.

Permanent force and permanent stress will be considered as the force and stress remaining in the prestressing steel after all losses, including creep and shrinkage of

concrete, elastic shortening of concrete, relaxation of steel, thermal affect, losses in post-tensioned prestressing steel due to sequence of stressing friction and take-up of anchorages, and all other losses peculiar to the method or system of prestressing have taken place or have been provided for in an approved stressing plan.

When friction must be reduced, water-soluble oil or graphite with no corrosive agents may be used as a lubricant subject to the approval of the Engineer. Lubricants shall be flushed from the duct as soon as possible after stressing is completed by use of water pressure. These ducts shall be flushed again just prior to the grouting operations. Each time the ducts are flushed, they shall be immediately blown dry with oil-free air.

2. Stressing Jacks. Each jack used to stress tendons shall be equipped with a pressure gauge having an accurate reading dial at least 150 mm in diameter for determining the jack pressure. The pressure gauge must be installed at or near the stressing ram. Prior to use for stressing on the project, each jack and its gauge shall be calibrated as a unit by a testing laboratory approved by the Engineer.

Calibration shall be done with the cylinder extension approximately in the position that it will be when applying the final jacking force and with the jacking assembly in an identical configuration to that which will be used at the job site (i.e., same length hydraulic lines). Certified calibration calculations and a calibration chart, both in metric units of measure, shall be furnished to the Engineer for each jack.

Re-calibration of each jack shall be done at six-month intervals and at other times when requested by the Engineer. At the option of the Contractor, calibrations subsequent to the initial laboratory calibration may be accomplished by the use of a master gauge.

The master gauge shall be calibrated at the same time as the initial calibration of the jacks, and shall be part of the unit for each jack. The data recorded during the initial calibrations shall be furnished to the Engineer for use in the field. The Contractor shall supply the master gauge in a protective waterproof container capable of protecting the calibration of the master gauge during shipment. The Contractor shall provide a quick-attach coupler next to the permanent gauge in the hydraulic lines, which enables the quick and easy installation of the master gauge to verify the permanent gauge readings. The master gauge shall remain in the possession of the Engineer for the duration of the project.

If a jack is repaired or modified, the jack shall be re-calibrated by the approved testing laboratory. No extra compensation will be allowed for the initial or subsequent jack calibrations or for the use and required calibration of a master gauge.

3. Stressing of Tendons. Post-tensioning forces shall not be applied until the concrete has attained the specified compressive strength as evidenced by tests on representative samples of the concrete.

A record of gauge pressures and tendon elongations for each tendon shall be provided by the Contractor for review and approval by the Engineer. Elongations shall be measured to an accuracy of 1 mm. Stressing tails of post-tensioned tendons shall not be cut off until the stressing records have been approved.

The stress in tendons during tensioning shall be determined by the gauge or load cell ratings and shall be verified with the measured elongations. Calculations of anticipated elongations shall utilize the modulus of elasticity, based on nominal area, as furnished by the Manufacturer for the lot of steel being tensioned, or as determined by a bench test of strands used in the work.

All tendons shall be tensioned to a preliminary force to eliminate any take-up in the tensioning system before elongation readings are started. This preliminary force shall be 20 percent of the final jacking force. The initial force shall be measured by a dynamometer, or by other approved method, so that its amount can be used as a check against elongation as computed and as measured. Each strand shall be marked prior to final stressing to permit measurement of elongation and to ensure that all anchor wedges set properly. The elongation in the tendon shall be measured before and after release of the jack in order to determine the actual anchor set. The anchor set at the dead end shall also be measured and monitored for slippage.

It is anticipated that there may be discrepancy in the indicated stress between jack gauge pressure and elongation. In such event, the load used as indicated by the gauge pressure shall produce a slight overstress rather than understress. When a discrepancy between gauge pressure and elongation of more than 5 percent in tendons over 15 meters long or 7 percent in tendons of 15 meters or less in length occurs, the entire operation shall be carefully checked and the source of error determined and corrected before proceeding further. When provisional ducts are provided for addition of prestressing force in the event of an apparent force deficiency in tendons over 15 meters long, the discrepancy between the force indicated by gauge pressure and elongation may be increased to 7 percent before investigation into the source of the error.

In the event that more than two percent of the individual strand wires in a tendon break during the tensioning operation, the tendon shall be removed and replaced. Previously tensioned strands shall not be allowed unless approved by the Engineer.

Post-tensioning bars used to apply temporary post-tensioning may be reused if they are undamaged.

Prestressing steel shall be cut using an abrasive saw within 20 mm away from the anchoring device. Flame cutting of prestressing steel is not allowed, except for pretensioned prestressing steel.

## **I. Grouting of Tendons.**

1. General. After post-tensioning and anchoring of a tendon has been completed and accepted, the annular space between the prestressing steel and the duct shall be grouted in accordance with these Special Provisions. In the interval between the post-tensioning and grouting operations, the prestressing steel shall be protected as specified in Construction Section B.

Within 4 hours after stressing and prior to grouting, protect tendons against corrosion or harmful effects of debris, by temporarily plugging or sealing all openings and vents, clean rust and other debris from all metal surfaces which will be covered by the grout cap and place the permanent non-metallic grout cap, including a seal, over the wedge plate until the tendon is grouted.

All grouting operations shall be carried out by experienced crew. The grouting operation supervisor must have a least three years of experience on previous projects involving grouting of similar type and magnitude and must have successfully attended a "Grouting Technician Training Course" offered by an accredited Professional Institution.

The Contractor shall submit a grouting operation plan for approval at least 45 days in advance of any scheduled grouting operations. Written approval of the grouting operation plan by the Engineer is required before any grouting of the permanent structure takes place.

At a minimum, provide the following items in the grouting operation plan:

- a. Provide names, training and experience records for the grouting crew and the crew supervisor in conformance with these Special Provisions.
- b. Type, quantity, and brand of materials used in grouting including all certifications required.
- c. Type of equipment furnished, including capacity in relation to demand and working condition, as well as back-up equipment and spare parts;
- d. General grouting procedure;
- e. Procedure for pre-grouting air pressure test of ducts and measures to eliminate or reduce the consequences of identified leakage;
- f. Duct repair procedures;
- g. Method to be used to control the rate of flow within ducts;
- h. Theoretical grout volume calculations.
- i. Types and locations of inlet and outlet pipes;
- j. Duct cleaning methods prior to grouting;
- k. Mixing and pumping procedures;
- l. Direction of grouting;
- m. Sequence of use of the inlets and outlet pipes;
- n. Procedures for handling blockages, including flushing of ducts;
- o. Procedures for possible post grouting repair.

Before grouting operations begin, a joint meeting of the Contractor, contractors grouting crew, grout manufacturer's field representative and the Engineer will be conducted to discuss the grouting operation plan, required testing, corrective procedures and any other issues requested by the Engineer.

The grout manufacturer's field representative shall be on site to witness the initial grouting operation and to provide technical assistance to the grouting crew.

2. Equipment. A colloidal grout mixer and pump shall be used that is capable of continuous mechanical mixing that will produce a grout free of lumps and undispersed cement, a grout pump, and standby flushing equipment with water supply. The equipment shall be able to pump the mixed grout in a manner that will comply with all requirements.

Accessory equipment that will provide for accurate solid and liquid measures shall be provided to batch all materials.

The pump shall be a positive displacement type and be able to produce an outlet pressure of at least 1.0 MPa. The pump should have seals adequate to prevent introduction of oil, air, or other foreign substance into the grout, and to prevent loss of grout or water.

A pressure gauge having a full-scale reading of no greater than 2.0 MPa shall be placed at some point in the grout line between the pump outlet and the duct inlet.

The grouting equipment shall contain a screen having clear openings 3.35 mm maximum size to screen the grout prior to its introduction into the grout pump. If a grout with aggregate or a thixotropic additive is used, a screen opening of 4.75 mm is satisfactory. This screen shall be easily accessible for inspection and cleaning.

The grouting equipment shall utilize gravity feed to the pump inlet from a hopper attached to and directly over it. The hopper must be kept at least partially full of grout at all times during the pumping operations to prevent air from being drawn into the post-tensioning duct.

Under normal conditions, the grouting equipment shall be capable of continuously grouting the largest tendon on the project in no more than 20 minutes.

Pipes or other suitable devices shall be provided for injection of grout and to serve as vent holes during grouting. The material for these pipes shall be at least 13 mm inside diameter and shall be made of a suitable plastic which will not react with the concrete or enhance corrosion of the prestressing steel and is free of water soluble chlorides. These pipes shall be fitted with positive mechanical shut off valves capable of withstanding grouting pressures. All connections between a grout pipe and a duct shall be made with plastic structural fasteners and taped with a waterproof tape as necessary so as to assure a watertight connection.

For all vertical tendons which have strands as the prestressing steel, a standpipe shall be provided at the upper end of the tendon to store bleed water and allow it to be reabsorbed by the grout. This device shall be designed so that the level of grout can be brought to an elevation which will assure that bleeding will at no time cause the level of the grout to drop below the highest point of the upper anchorage device. Provision shall be made to assure that bleed water rises into the standpipe, not into the uppermost part of the tendon and anchorage device.

3. Mixing Grout. The grout shall be mixed in colloidal mixer capable of continuous mixing which will produce a grout free of lumps and undispersed cement. The sequence for charging the mixer shall be add water, start mixer, and add cement. When cement and water are reasonably well mixed, admixtures shall be introduced in accordance with written instructions of the manufacturer of each admixture. The mixing procedures shall prevent admixture from getting caught on blades or sides of drum and from forming gel globules. The mixing procedure may be varied in accordance with the written recommendations of the manufacturer of the admixtures.

The grout shall be mixed until a uniformly blended mixture is obtained and shall be continuously agitated until it is introduced into the group pump. Batches of grout shall be placed within 30 minutes of mixing. No water shall be added to the grout to modify its consistency after the initial mixing operation is completed.

Perform a fluidity test on the mixed grout prior to beginning the injection process. Obtain target flow rates as a function of mixer type used and ambient temperatures from the grout manufacturer. Do not begin the grouting process until the proper grout properties have been obtained.

Pre-packaged grouts shall be mixed and used in complete units only.

4. Preparation of Ducts. All ducts shall be clean and free of deleterious materials that would impair bonding or interfere with grouting procedures.

Flushing of the ducts with water shall not be allowed unless approved by the Engineer. If flushing is required, the duct shall be dry a minimum of 6 hours prior to the start of grout placement. The ducts shall be dry prior to grouting. If inadvertent water is suspected in the ducts, the ducts shall be blown out with oil-free compressed air until all moisture is removed from the prestressing steel and the inside surfaces of the duct.

5. Placing Grout. All grout and high-point vent openings shall be open when grouting starts. Grout shall be allowed to flow from the first vent after the inlet pipe until any entrapped air has been removed and a minimum of one liter of grout has exited the vent, at which time the vent should be capped or otherwise closed. Remaining vents shall be closed in sequence in the same manner.

The pumping pressure at the tendon inlet shall not exceed 1.7 MPa.

If the actual grouting pressure exceeds the maximum recommended pumping pressure, grout may be injected at any vent that has been or is ready to be capped, as long as a one-way flow of grout is maintained. If this procedure is used, the vent that is to be used for injection shall be fitted with a positive shutoff.

When one-way flow of grout cannot be maintained, the grout shall be immediately flushed out of the duct with water.

Grout shall be pumped through the duct and continuously wasted at the outlet pipe until no visible slugs of water or air are ejected and the efflux time of the ejected grout, as measured by a flow cone test, if used, is not less than that of the injected grout. To ensure that the tendon remains filled with grout, the outlet shall then be closed and the pumping pressure allowed to build a minimum of 0.50 MPa before the inlet vent is closed. Plugs, caps, or valves thus required shall not be removed or opened until the grout has set.

After the grout has set, pipes used as injection or vent ports shall be cut off. Plastic pipes shall be cut off flush with the surface of the concrete and any void spaces sealed with epoxy.

6. Temperature Considerations. Grouting shall not occur when air temperatures are below 0°C or concrete temperatures are below 4°C. Ducts shall be kept free of water to avoid damage due to freezing. The temperature of the concrete or air surrounding the tendon shall be maintained at 2°C or above from the time of grouting until the compressive strength of the grout, as determined from tests on 50 mm cubes cured under the same conditions as the in-place grout, exceeds 5.5 MPa.

Under hot weather conditions, grouting shall take place early in the morning when daily temperatures are lowest. The grout temperature shall not be above 30°C during mixing or pumping. If necessary, the mixing water and grout shall be cooled.

7. **Quality Control Testing of Grouts by Contractor.** A minimum of 45 days prior to grouting, a 2.2 kg sample of pre-approved grout must be submitted for testing by the department. If there is fine aggregate in the grout, it shall conform to ASTM C33, and be non-reactive per ASTM C295, C289, and C1260. Additional testing shall be performed by the Contractor at the frequencies listed in the following table. Control charts shall be maintained for each test. When one result is outside the requirement, each batch of grout shall be tested until four batches comply.

#### Quality Control Testing of Grout

Test	Method	Frequency (min.)	Requirement
Flow	ASTM C 939	Each batch	Min. of 11 sec.
Bleeding	ASTM C 940	Startup & 1/week	0% after 3 hours
Wick-induced bleeding	ASTM C 940 mod.	Startup & 1/week	0% after 4 hours
Set time	ASTM C 953	Startup & 1/week	3 hrs. minimum; 12 hrs. maximum
Volume change	ASTM C 1090	Startup & 1/month	0% reduction at 24 hours; 0.3 % vol. Change at 28 days
Compressive strength	ASTM C 942	Startup & 1/day	28 MPa at 7 days; 40 MPa at 28 days

\*Testing frequency shall be increased until the mix is within the requirement range. If corrections cannot be readily made in the opinion of the Engineer, the grout material shall be rejected.

- J. **Protection of Prestress Anchorages.** After grouting has been completed for a minimum of 72 hours, remove the permanent non-metallic grout cap covering the wedge plate and check for voids in the presence of the Engineer. Do not fill any voids or begin activities to protect the end anchorage prior to inspection by the Engineer. Upon inspection by the Engineer, replace the permanent grout cap and fill any voids using methods approved by the Engineer.

Within 54 hours after grout cap inspection, clean exposed areas of end anchorages and other metal accessories of rust, misplaced mortar, grout and other such materials by abrasive blasting. Care shall be exercised not to damage the non-metallic anchor caps. Immediately following the cleaning operation, the entire surface of the anchorage recess (concrete and anchor) shall be uniformly coated with an epoxy meeting the requirements of AASHTO M235 (ASTM C881) Class III. The epoxy shall be applied in a thickness and manner as recommended by the manufacturer.

Tight fitting forms shall be installed and held in place securely against the previously placed concrete. Within the "tack time" period of the epoxy, the entire anchorage recess

shall be filled with a non-shrink grout. The grout shall fill the recess to a clean, neat surface that is flush with the surrounding concrete.

The non-shrink grout shall be pre-bagged, commercial grout as approved by the Engineer. Use only non-chloride bearing, non-shrink grout mixes for anchorage protection. The grout shall have a 40 MPa compressive strength at 28 days, a chloride permeability resistance of less than 2000 coulombs at 28 days and a freeze/thaw resistance of greater than 90% at 300 cycles and greater than 85% at 500 cycles.

#### METHOD OF MEASUREMENT

Furnishing, Installing and Stressing Post-Tensioning Tendons will be measured for payment on a lump sum basis.

#### BASIS OF PAYMENT

This item of work shall be paid for at the contract lump sum price for FURNISHING, INSTALLING AND STRESSING POST-TENSIONING TENDONS, which payment shall constitute full compensation for all tools, material, labor and equipment necessary to furnish, install, stress, test and grout the post-tensioning tendons as described herein, as shown on the contract plans and as directed by the Engineer.

This payment shall also include lubricants in the tendon ducts for friction control and flushing the lubricant from the tendon ducts after stressing. No separate measurement and payment will be made for anchorage components, local anchorage zone reinforcement supplied as an integral part of a proprietary anchorage system, nor ducts for similar post-tensioning system hardware. Anchorage components, ducts, reinforcing steel for duct support, and similar items of post-tensioning system hardware which are embedded within precast components or cast-in-place concrete shall be deemed to be included in the cost of the precast components or cast-in-place concrete.

All temporary prestressing material and labor shall be incidental to permanent prestressing.

#### CONCRETE SLOPEWALL (SPECIAL)

Description. The slope wall shall be constructed on an approved earth bed as specified and in accordance with manufacturers recommendations.

Materials. Materials shall meet the requirements of the following Articles of Section 1000 – Materials and all manufacturers requirements:

Item	Article/Section
(a) Portland Cement Concrete .....	1020
(b) Fabric Reinforcement .....	1006.10

Imprinted Concrete: Bomanite Corporation imprinting tools or approved equal as specified below.

Bomanite Corporation P.O. Box 599  
Madera, California 93639-0599  
Tel: (559) 673-2411



Fax: (559) 673-8246

Manufacturer: Bomanite Corporation  
Product: Bomacron  
Pattern Name: Random Slate  
Texture: Regular Slate Texture

Surface Applied Finish  
Manufacturer: L.M. Scofield Company, 800-800-9900  
Product: Lithochrome Chemstain Classic  
Color: CS-15 Antique Amber (submit sample for review prior to application)

## CONSTRUCTION REQUIREMENTS

**General.** The methods of construction shall comply with Sections 502 and 503. Preferably, the slope wall shall be constructed in alternate sections each approximately 2.7m (9 ft) in width. The fabric reinforcement shall be supported 50 mm (2 in) below the maximum impression in the imprinted top slab. A clear distance of 50 mm (2 in) shall be maintained between the fabric reinforcement and the outside face of any vertical or inclined toe or cutoff wall. The fabric reinforcement shall be continuous across all construction joints and shall extend into each section a minimum of 150 mm (6 in) in all cases.

**Curing and Protection.** Equipment to be used for applying membrane curing, if used, shall meet the requirements of Article 1101.09 (b) and all manufacturers recommendations.

### Method of Measurement

- (a) **Contract Qualities.** The requirements of the use of Contract Quantities shall conform to Article 202.07 (a).
- (b) **Measured Quantities.** Slope wall will be measured for payment in place and the area computed in square meters (square yards). In computing the quantity for payment, the dimensions used will be those established by the Engineer to conform to the elevations of the natural ground line or streambed. The area for measurement will include the upper, sloped surface of the wall. Anchor and cut-off walls will not be measured for payment, but shall be considered as included in the contract unit price bid for slope wall.

**Basis of Payment.** This work will be paid for at the contract unit price per square meter (square yard) for CONCRETE SLOPEWALL (SPECIAL) of the thickness specified, which price shall include payment for preparation of earth bed, excavation, backfilling, imprinting, coloring, disposal of surplus material, and furnishing and placing all materials, including fabric reinforcement and anchor and cut-off walls.

### **TRAFFIC BARRIER RAIL**

Description: This item or work shall consist of furnishing all materials, tools, equipment and labor required to complete the fabrication and installation of the Traffic Barrier Rail as detailed on the Plans and as described herein.

General: The Traffic Barrier Rail shall be in accordance with Sections 505, 506 and 509 of the Standard Specifications except as noted. Hollow structural steel tubing shall conform to the requirements of ASTM A500, Grade B, Structural Steel Tubing. All other steel shapes and plates shall conform to the requirements of AASHTO M-270 M Grade 250.

The anchor studs, nuts and washers shall be installed in accordance with Section 584 of the Standard Specifications. The Contractor must space the reinforcement in the traffic barrier to miss the studs. As an alternate the Contractor may build the studs into the concrete.

The Traffic Barrier Rail shall be painted in the shop and field touch-up of damaged portions shall be required as necessary.

Method of Measurement: The Traffic Barrier Rail will be measured for payment in feet. The length paid for will be the overall length along the top longitudinal railing member through all posts and gaps.

Basis of Payment: This item of work will be paid for at the contract unit price per foot for **TRAFFIC BARRIER RAIL**, which price shall include furnishing all labor, tools, equipment and materials to fabricate, furnish and erect the Traffic Barrier Rail as shown on the Plans, described herein and as directed by the Engineer.

### **REMOVE AND REPLACE EXISTING STONE WALL**

This work will consist of removing, storing and reinstalling existing stone wall segments on an aggregate base with a granular backfill. Final locations and elevations will be determined in the field during construction.

Materials:

1. Aggregate base course will conform to Article 1004.04, CA 6, Type B.
2. Granular backfill will conform to Article 1004.05, CA 18.

This work will be paid at the contract unit price per square foot for **REMOVE AND REPLACE EXISTING STONE WALL**, measurement will include wall face that is below finished grade. The price will include all labor, materials and equipment necessary to remove and reinstall the existing stone wall as specified herein.

## **SEGMENTAL CONCRETE BLOCK WALL**

**Description:** This work shall consist of furnishing the design computations, shop plans, materials equipment and labor to construct a Segmental Concrete Block Retaining Wall with a maximum height of 5 ft as measured from the top of block elevation to the finished grade line at the wall face.

**General:** The wall shall consist of a leveling pad, pre-cast concrete blocks, select backfill and, if required by the design, soil reinforcement and drainage system. The materials, fabrication and construction of the wall components are subject to approval by the Engineer. The Engineer reserves the right to obtain random samples for material testing. The wall shall be designed and constructed according to the lines, grades and dimensions shown on the contract plans and approved shop plans.

**Submittals:** The wall supplier shall submit design computations and shop plans to the Engineer. The shop plans shall be sealed by an Illinois Licensed Professional Engineer and shall include all details, dimensions, quantities and cross sections necessary to construct the wall and shall include, but not be limited to, the following items:

- (a) Plan, elevation and cross section sheet(s) for each wall showing the following:
  - 1) A plan view of the wall indicating the offsets from the construction centerline to the first coarse of blocks at all changes in horizontal alignment. These shall be calculated using the offsets to the front face of the block shown on the contract plans and the suppliers proposed wall batter. The plan view shall indicate bottom (and top coarse of block when battered), the excavation and select granular backfill limits, as well as, any soil reinforcing and drainage system required by the design. The centerline of any drainage structure or pipe behind or passing through/under the wall shall also be shown.
  - 2) An elevation view of the wall, indicating the elevation and all steps in the top coarse of blocks along the length of the wall. The top of these blocks shall be at or above the theoretical top of block line shown on the contract plans. This view shall also show the steps and proposed top of leveling pad elevations as well as the finished grade line at the wall face specified on the contract plans. These leveling pad elevations shall be located at or below the theoretical top of leveling line shown on the contract plans. The location, size and length of any soil reinforcing connected to the blocks shall be indicated.
  - 3) Typical cross section(s) showing the limits of the select granular backfill, soil reinforcement and drainage system if used in the design. The right-of-way limits shall be indicated as well as the proposed excavation, cut slopes and the elevation relationship between existing ground conditions and proposed grades.
  - 4) All general notes required for constructing the wall.
- (b) All details for the leveling pads, including the steps, shall be shown. The theoretical top of the leveling pad shall either be below the anticipated frost depth or 1.5 feet below the finished grade line at the wall face, whichever is greater; unless otherwise shown on the plans. The minimum leveling pad thickness shall be 6 in.

- (c) Cap blocks shall be used to cover the top of the standard block units. The top coarse of blocks and cap blocks shall be stepped to satisfy the top of block line shown on the contract plans.
- (d) All details of the block and/or soil reinforcement placement around all appurtenances located behind, on top of or passing through the wall shall be clearly indicated. Any modifications to the design of these appurtenances to accommodate a particular design arrangement shall also be submitted.
- (e) All details of the blocks, including color and texture shall be shown. The exterior face shall preferably be straight, textured with a "split rock face" pattern, and dark gray in color unless otherwise stated on the plans.
- (f.) All block types (standard, cap, corner and radius turning blocks) shall be detailed showing all dimensions.
- (g.) All blocks shall have alignment/connection devices such as shear keys, leading/trailing lips or pins. The details for the connection devices between adjacent blocks and the block to soil reinforcement shall be shown. The block set or face batter shall be limited to 20 degrees from vertical, unless otherwise shown by the plans.

The initial submittal shall include 3 sets of prints of the detail shop plans and 1 set of calculations. One set of plans will be returned to the Contractor with any corrections indicated. After approval, the Contractor shall furnish the Engineer with 8 sets of corrected plan prints for distribution. No work or ordering of materials for the structure shall be done by the Contractor until the submittal has been approved in writing by the Engineer.

Materials: The materials shall meet the following requirements:

- (a) Pre-cast Concrete Block: The block proposed for use shall be produced according to the Department's Policy Memorandum "Quality Control/Quality Assurance Program for Precast Concrete Products", and shall satisfy the following:
  - (1.) Fly ash shall be according to Article 1010.03.
  - (2) Ground granulated blast-furnace slag shall be according to AASHTO M 302.
  - (3.) Aggregate shall be according to Articles 1003.02 and 1004.02, with the exception of gradation. Chert gravel may be used based on past in-service satisfactory performance, in the environment in which the product was used.
  - (4) Water shall be according to Section 1002.
  - (5) Testing for freeze-thaw durability will not be required. However, unsatisfactory field performance as determined by the Department will be cause to prohibit the use of the block on Department projects.
- (b) Select Granular Backfill: The material behind the blocks and above a 1:1 slope extending upward from either the back of the bottom block or soil reinforcement

(whichever is greater) shall consist of either a coarse aggregate according to Article 1004.06(a), or a fine aggregate according to the first sentence of Article 1003.04(a), the aggregate used shall also meet the following:

Coarse Aggregate Gradation	CA-6 thru CA-16 (Article 1004.01(c))
Fine Aggregate Gradation	FA 1, FA 2 or FA 20 (Article 1003.01(c))
Coarse Aggregate Quality	Minimum Class C (Article 1004.01(b))
Fine Aggregate Quality	Minimum Class C (Article 1003.01(b))
Internal Friction Angle	34° minimum (AASHTO T 236)
PH	4.5 to 9 (AASHTO T 289)

When a fine aggregate is selected, the rear of all block joints shall be covered by a non-woven need punch geotextile filter material according to Article 1080.05 of the Standard Specifications and shall have a minimum permeability according to ASTM D 4491 of 0.008 cm/sec. All fabric overlaps shall be 6 inches and non-sewn. As an alternative to the geotextile, a coarse aggregate shall be placed against the back face of the blocks to create a minimum 12 inches wide continuous gradation filter to prevent the select fill material from passing through the block joints.

- (c) Leveling pad: The material shall be either Class SI concrete according to Article 1020.04 or compacted coarse aggregate according to Articles 1004.04, (a) and (b). The compacted coarse aggregate gradation shall be CA-6 or CA-10.
- (d) Soil Reinforcement: If soil reinforcement is required by the approved design, the Contractor shall submit a manufacturer's certification for the soil reinforcement properties which equals or exceeds those required in the design computations. The soil reinforcement shall be manufactured from high density polyethylene (HDPE) uniaxial or polypropylene biaxial resins or high tenacity polyester fibers with a PVC coating, stored between -20 and 140° F. The following standards shall be used in determining and demonstrating the soil reinforcement capacities:

ASTM D-638	Test Method for Tensile Properties of Plastic
ASTM D-1248	Specification for Polyethylene Plastics Molding and Extrusion Materials
ASTM D-4218	Test Method for Carbon Black Content in Polyethylene Compounds
ASTM D-5262	Test Method for Evaluating the Unconfined Tension Creep Behavior of Geosynthetics
GG1-Standard	Test Method for Geogrid Rib Tensile Strength
GG2-Standard	Test Method for Geogrid Junction Strength
GG4-Standard	Practice for Determination of the Long Term Design Strength of Geogrid
GG5-Standard	Practice for Evaluating Geogrid Pullout Behavior

Design Criteria: The design shall be according to AASHTO Specifications and commentaries for Earth Retaining Walls or FHWA Publication No. HI-95-038, SA-96071 and SA-96-072. The wall supplier shall be responsible for all internal stability aspects of the wall design.

Internal stability design shall insure that adequate factors of safety against overturning and sliding are present at each level of block. If required by design, soil reinforcement shall be utilized and the loading at the block/soil reinforcement connection as well as the failure surface must be indicated. The calculations to determine the allowable load of the soil reinforcement

and the factor of safety against pullout shall also be included. The analysis of settlement, bearing capacity and overall slope stability are the responsibility of the Department.

External loads such as those applied through structure foundations, from traffic or railroads, slope surcharge etc., shall be accounted for in the internal stability design. The presence of all appurtenances behind, in front of, mounted upon or passing through the wall volume such as drainage structure, utilities, structure foundation elements or other items shall be accounted for in the internal stability design of the wall.

Construction Requirements: The Contractor shall obtain technical assistance from the supplier during wall erection to demonstrate proper construction procedures and shall include all costs related to this technical assistance in the unit price bid for this item.

The foundation material for the leveling pad and select granular backfill volume shall be graded to the design evaluation and compacted according to Article 205.06, except the minimum required compaction shall be 95% of the standard laboratory density. Any foundation soils found to be unsuitable shall be removed and replaced as directed by the Engineer and shall be paid for according to Article 109.04.

The select granular backfill lift placement shall closely follow the erection of each course of blocks. All aggregate shall be swept from the top of the block prior to placing the next block lift. If soil reinforcement is used, the select granular backfill material shall be leveled and compacted before placing and attaching the soil reinforcement to the blocks. The soil reinforcement shall be pulled taut, staked in place, and select fill placed from the rear face of the blocks outward. The lift thickness shall be the lesser of 10 inches loose measurement or the proposed block height.

The select granular backfill shall be compacted according to Article 205.06, except the minimum required compaction shall be 95% of the standard laboratory density. Compaction shall be achieved using a minimum of 3 passes of a lightweight mechanical tamper, roller or vibratory system. The top 12 inches of backfill shall be a cohesive, impervious material capable of supporting vegetation, unless other details are specified on the plans.

The blocks shall be maintained in position as successive lifts are compacted along the rear face of the block. Vertical, horizontal and rotational alignment tolerances shall not exceed 1/2 inch when measured along a 10 ft. straight edge.

Method of Measurement: Segmental Concrete Block Wall will be measured by the square yard of wall face from the top of block line to the theoretical top of the leveling pad for the length of the wall in a vertical plane, as shown on the contract plans.

Basis of Payment: This work shall be paid for at the contract unit price per square yard for SEGMENTAL CONCRETE BLOCK WALL.

#### **DUCTILE IRON WATER MAIN, 6"**

#### **DUCTILE IRON WATER MAIN, 12"**

Description: The Contractor shall furnish and install the proposed water main of the diameter specified at the locations shown on the plans. The water main shall include excavation, granular bedding, haunching, installation of the water main, iron fittings, restraint devices, polyethylene

wrap, testing and chlorination of the water main, backfill and compaction of the trench and all incidental items required for a complete and operational water main.

Water main pipe shall be Class 52 ductile iron pipe, conforming to AWWA specification C151 (A.N.S.I. A21.51).

All ductile iron pipe and/or fittings shall have an interior cement mortar lining and bituminous seal coat conforming to the requirements of AWWA specification C104 (ANSI A21.4).

Joints for water main shall be rubber push-on joints or mechanical joints, conforming to AWWA C151 (ANSI A21.51) and AWWA C111 (ANSI A21.11).

#### Push-on Joints

Sections of water main pipe shall be connected by means of push-on joints, consisting of bells cast integrally with the pipe, which have interior angular recesses conforming to the shape and dimension of a rubber sealing gasket. The interior dimensions of which is such that it will admit the insertion of the spigot end of the joining pipe in a manner that will compress the gasket tightly between the bell of the pipe and the inserted spigot, thus securing the gasket and sealing the joint. Such push-on joints shall be of the following makes or equal, conforming to the requirements of AWWA C111 (ANSI A21.11).

- (1) American Cast Iron Pipe Company.
- (2) Tyton - as supplied by the U.S. Pipe and Foundry Co.

The lubricant used in conjunction with the push-on joints shall be of material that is recommended by the suppliers specified above, or an acceptable commercially processed animal fat or vegetable shortening.

Restrained push-on joint piping shall be Flex-Ring, Lok-Ring, TR Flex or equal.

#### Mechanical Joints

Restraint of mechanical joints shall be incorporated into the follower gland and shall include a mechanism to impart multiple wedging action that increases with increasing pipe pressure. Follower glands with restraining mechanisms shall be manufactured of ductile iron conforming to ASTM A536. Dimensions of the follower gland shall conform to and shall be compatible with mechanical joints conforming to ANSI/AWWA C111/A21.11. The mechanical joint restraint device shall have a working pressure of 250 psi and a minimum safety factor of 2:1. The mechanical joint restraint device shall be MEGALUG as manufactured by EBAA Iron, Inc. or equal.

The water main shall be wrapped with 8 mil. polyethylene film in tube or sheet form and shall be in accordance with AWWA C105/A21.5 suitable for the appropriate diameter of pipe.

Fittings shall be cement lined, tar coated ductile iron with mechanical joints rated 250 psi per AWWA C110/ANSI 21.10. (American, U.S. Pipe or equal).

The water main shall be installed as detailed on the plans and in accordance with the applicable provisions of the Standard Specifications for Water and Sewer Main Construction in Illinois. The water main shall be installed to the grades shown on the plans and shall have a nominal minimum depth of cover of five feet (5'-0"). The excavation for the water main could be made using trenching equipment or other suitable excavating equipment.

If the excavation has been made deeper than necessary, the water main shall be laid at the lower depth, and no additional cost shall be charged to the OWNER for the extra excavation, or for subsequent adjustments to fire hydrants or valve vaults. All excavated materials not needed for backfilling the trenches shall be disposed of by the Contractor.

Non-paved areas shall be backfilled from a point above the bedding with originally excavated material free from rocks, frozen material or large clods and shall be carefully placed and compacted to prevent damage to or the dislodging of the water main pipe. Cost of this backfilling shall be considered incidental to the water main construction.

After backfill is completed all trenches within the non-paved areas shall be compacted by jetting and watersoaking in accordance with Section 20-2.21D of the Standard Specifications for Water and Sewer Main Construction in Illinois, or by other approved methods set forth in said Standard Specifications.

In paved areas, select granular backfill and surface restoration shall be done in accordance with the applicable sections of these Special Provisions.

Long radius curves, either horizontal or vertical, may be laid with standard pipe by deflections at the joints. If the pipe is shown curved on the plans and no special fittings are shown, the Contractor can assume that curves can be made by deflection of the joints with standard lengths of pipe. If shorter lengths are required, the plan will indicate maximum lengths that can be used.

Where field conditions require deflection of curves not anticipated by the plans, the City Engineer will approve the methods to be used.

Maximum deflections at the pipe joints and laying radius for various pipe lengths are as found in the following standards:

Ductile Iron Pipe Mechanical Joints AWWA C600  
Ductile Iron Pipe Push-On Joints AWWA C600

At no time shall the deflection of the pipe joints exceed the manufacturer's maximum recommended deflection.

When rubber gasketed pipe is laid on a curve, the pipe shall be deflected at the joints. Deflections shall not exceed manufacturer's recommendations. Trenches shall be made wide on curves for this purpose.



Where a water main must cross a sanitary or storm sewer, the invert of the water main shall be a minimum of 18 inches above the crown of the sewer for at least 10 feet each side of the crossing, in accordance with IEPA separation requirements.

Where proper vertical separation is not obtainable, a length of the storm or sanitary sewer at least 10 feet on either side of the crossing shall be replaced with water main grade pipe. The water main shall be backfilled with granular material.

Water in the trench shall be removed during pipe laying and jointing operations. Provisions shall be made to prevent floating of the pipe. Trench water shall not be allowed to enter the pipe at any time.

Adequate provisions shall be made for safely storing and protecting all water pipe prior to the actual installation in the trench. Care shall be taken to prevent damage to the pipe castings, both inside and out. Provisions shall be made to keep the inside of the pipe clean throughout its storage period and to keep mud and/or debris from being deposited therein.

All pipe shall be thoroughly cleaned on the inside before laying. Proper equipment shall be used for the safe handling, conveying and laying of the pipe. All pipe shall be carefully lowered into the trench, piece by piece, by means of suitable tools or equipment, in such a manner as to prevent damage to water main materials and protective coatings and linings. Under no circumstances shall water main material be dropped or dumped into the trench.

The pipe shall be inspected for defects. All lumps, blisters and excess coal tar coating shall be removed from the ends of each pipe, and the inside of the bell.

Field-cut pipe shall be beveled to avoid damage to the gasket and facilitate making the joint.

The pipe shall be installed in polyethylene encasement in accordance with the installation guidelines in AWWA specifications C105/A21.5 and as detailed on the plans. Cost of this wrap shall be considered incidental to the water main construction.

When connecting joints, all portions of the joining materials and the socket and spigot ends of the joining pipe shall be wiped clean of all foreign materials. The actual assembly of the joint shall be in accordance with the manufacturer's installation instructions. During the construction and until joining operations are complete, the open ends of all pipes shall be at all times protected and sealed with temporary water tight plugs.

The entire section of the pipe shall be pushed forward to seat the spigot end into the bell. After the section of pipe is inserted into the bell (when joining pipe to mechanical joint fittings) the gasket shall then be pressed into place within the bell, being careful to have the gasket evenly located around the entire joint.

When installing iron fittings, all fittings which deflect the flow 11-1/4 degrees or greater shall have restrained joints and a thrust block. Thrust blocks shall be poured concrete of the

dimensions shown on the drawings and in accordance with the provisions of the Standard Specifications for Water and Sewer Main Construction in Illinois as shown on the plans.

When a stretch of pipe and appurtenances have been completed the Contractor shall furnish proper appliances and facilities for testing and draining the same, without injury to the work or surrounding territory. He shall test by filling the pipe with clean water under a minimum hydrostatic pressure of one hundred fifty (150) pounds per square inch for four (4) hours in accordance with City of Naperville requirements. Water for performing tests shall be supplied by the City of Naperville for filling and flushing main.

After completion of the pressure test, the Contractor shall conduct a leakage test to determine the quantity of water lost by leakage under the specified test pressure. The leakage test shall be in conformance with 41-2.13C of the "Standard Specifications for Water and Sewer Main Construction in Illinois," Fifth Edition. Allowable leakage shall be as shown in the following table:

Table 1. Allowable leakage for pipeline per 1,000 feet (gallons per hour)

Avg. Test Pressure	Pipe Size in Inches											
PSI	2	3	4	6	8	10	12	14	16	18	20	24
200	0.21	0.32	0.43	0.64	0.85	1.06	1.28	1.48	1.70	1.91	2.12	2.55
175	0.20	0.30	0.40	0.59	0.80	0.99	1.19	1.39	1.59	1.79	1.98	2.38
<b>150</b>	<b>0.19</b>	<b>0.28</b>	<b>0.37</b>	<b>0.55</b>	<b>0.74</b>	<b>0.92</b>	<b>1.10</b>	<b>1.29</b>	<b>1.47</b>	<b>1.66</b>	<b>1.84</b>	<b>2.21</b>
125	0.17	0.25	0.34	0.50	0.67	0.84	1.01	1.18	1.34	1.51	1.68	2.01
100	0.15	0.23	0.30	0.45	0.60	0.75	0.90	1.05	1.20	1.35	1.50	1.80
80	0.14	0.20	0.27	0.41	0.54	0.68	0.81	0.95	1.08	1.22	1.35	1.62
60	0.12	0.18	0.23	0.35	0.47	0.59	0.70	0.82	0.94	1.06	1.17	1.41

When pressure and leakage tests are completed and prior to being placed into service, the water main pipe and appurtenances shall be disinfected by a method of chlorination approved by the Engineer. Disinfection of the water main shall conform to Sections 41-2.13A through 41-2.14I of the "Standard Specifications for Water and Sewer Main Construction in Illinois," Fifth Edition.

Any defects, cracks or leakage that may develop or may be discovered, either in the joints or in the body of the castings, shall be promptly repaired by the Contractor at his own expense.

Any existing utility structures requiring adjustment or reconstruction shall be completed by the contractor to the satisfaction of the utility owner. Adjustments and/or reconstructions not called for on the plans shall be considered incidental to the contract. No more than a total of 12 inches of adjusting rings and/or 2 adjusting rings shall be allowed.

Method of Measurement: Water main (of the diameters specified) shall be measured for payment by the lineal foot in place. Water mains shall be measured along the centerline of the water main from the center of the valve to the center of the valve, fittings, or end of pipe.

Basis of Payment: This work shall be paid for at the contract unit price per lineal foot for DUCTILE IRON WATER MAIN, 12" and DUCTILE IRON WATER MAIN, 6", which price shall be considered payment in full for completing this work as specified, including excavation, bedding, haunching, polyethylene wrap, iron fittings, installation of water main, restraint devices, thrust blocks, backfill, jetting, pressure testing, chlorination and all labor, tools, equipment and incidental items as shown on the plans and as specified herein to construct a complete and operational water main.

### **WATER SERVICE LINE ¾"**

Description: This work shall include tapping a new Type K copper water service to a new water main as shown on the plans or as directed by the Engineer in accordance with the City of Naperville Standard Details. This work shall include all necessary materials, labor, excavation, backfill (non-structural) and equipment necessary to connect the proposed service to the water main. The necessary materials include, but are not limited to, the corporation stop and domestic water service box.

All services shall be equipped with corporation stop, curb stop and curb box. Curb stops are to be compression type by Mueller or Ford (for ductile iron pipe water mains).

Water main services shall be connected to the corporation stop in accordance with the manufacturers recommendations. Where shown on the plan, service lines shall generally connect to new or existing curb boxes. When directed by the engineer, service lines may be connected to existing service lines thru the use of approved coupling devices, the cost of such connections shall not be paid for separately. Tapping of proposed water main shall be considered incidental to this pay item.

All work shall be performed in accordance with the appropriate sections of the Standard Specifications for Water and Sewer Main Construction in Illinois and the City of Naperville's Standard Specifications.

Method of Measurement: The installation of water service line of the size indicated on the plans shall be measured for payment by the lineal foot in place.

Basis of Payment: This work shall be paid for at the contract unit price per lineal foot for WATER SERVICE LINE ¾", which price shall include all necessary materials, excavation, installation of pipe, fittings, corporation stops, couplings, curb boxes, granular backfill, bedding, and all labor, tools, equipment and incidental items as shown on the plans and as specified herein to connect the proposed service to the water main.

### **FIRE HYDRANTS TO BE REMOVED**

Description: This work shall consist of removing the existing fire hydrant and auxiliary valve and associated piping at the locations and shown on the plans or as directed by the Engineer.

To minimize the inconvenience to affected residents, 48 hours prior to shutting the existing main down, the City of Naperville and all users that will be affected shall be notified in writing. The Contractor shall cooperate with the City of Naperville's Department of Public Utilities personnel to locate valves necessary to isolate the work areas. All valves will be operated by City of

Naperville Public Utility personnel (call 630-420-4122 a minimum of 48 hours in advance to schedule this work).

Contractor shall excavate a deep enough sump pit at the location where piping will be removed so that dewatering pumps will prevent contaminated trench water from entering the existing water main. Restrained mechanical plugs with thrust blocks shall be installed at all locations of fire hydrant removals and shall be installed at the main line tee. Plug shall be properly disinfected prior to installation. Contractor to install any necessary corporation stops to facilitate disinfection and sampling procedures. As-built drawing to reflect actual location of buried tee.

Method of Measurement: Measurement for fire hydrants to be removed shall be measured for payment on a per each basis at each location shown in the plans.

Basis of Payment: This work shall be paid for at the contract unit price per each for FIRE HYDRANTS TO BE REMOVED, which price shall be considered payment in full for completing this work as specified, including excavation, removal of existing piping, plugs, thrust blocking, backfill, materials, labor, equipment, delivery of hydrant to Owner, and all labor, tools, equipment and incidental items as shown on the plans and as specified herein to complete this work.

### **FIRE HYDRANT WITH AUXILIARY VALVE AND VALVE BOX**

Description: This item shall consist of furnishing fire hydrants with auxiliary valves with valve boxes and installing them at the locations shown on the drawings and in accordance with the Standard Specifications for Water and Sewer Main Construction in Illinois.

#### **Fire Hydrants**

Fire hydrants shall be Clow F-2500, Waterous Pacer WB-67, or Mueller Centurion A-421. Model shall be a breakaway flange type and shall be provided with a valve opening of 5 1/4 inches and equipped with two 2-1/2 inch hose connections and one 4-1/2 inch male pumper connection. Outside diameter of the male thread on the 2-1/2 inch hose connection shall be National Standard threads.

A suitable tee of the quality and kind herein specified shall be placed in the water main opposite each of the fire hydrants and shall be connected with the hydrant by means of the valve and connecting pipe. Each hydrant should be provided with stainless steel rods with restraining joints. All nuts, bolts and threaded rods shall be stainless steel.

Each hydrant shall be provided with a drain that will leave no water standing in the barrel of the hydrant when the hydrant is closed. This drain shall close tightly before the hydrant begins to open. The hose and pumper connections shall be securely leaded and locked into the hydrant and each shall be provided with a suitable cast iron threaded cover securely attached to the hydrant by a steel chain of at least 1/8" thickness.

The fire hydrant shall be designed to withstand, without leaking or damage to the hydrant, a hydraulic pressure of 300 pounds per square inch and an operating pressure of 150 pounds per square inch.

### 6" Auxiliary Valves and Valve Box

Gate valves shall meet the requirements of the latest revision of AWWA C509. Gate valves shall open to the left (counter clockwise) and shall have mechanical joints ends. Gate valves through 12" in diameter shall have resilient seats. Gate valves installed in fire hydrant leads shall have "O" ring stuffing box. Gate valves shall be as manufactured by Clow, American Waterous, or Kennedy.

Stem and all working parts shall be fully protected from moisture or weather damage by complete enclosure. Operating nuts shall be cast iron. Operating nuts shall be 2 inches square. All nuts, bolts and threaded rods shall be stainless steel.

Valves shall be installed in accordance with the manufacturer's recommendations. Valves shall be placed on a cast-in-place concrete valve pedestal of the dimensions shown on the drawings. A 1/2" preformed joint filler shall be placed between the valve and the pedestal to facilitate future removal of the valve.

Valves boxes shall be Tyler Series 6850 or approved equal.

Each hydrant shall be rodded to the supplying tee fitting and set on a flat stone or concrete thrust block not less than 24 inches by 24 inches by 4 inches in thickness. A minimum of 2 cubic yards of gravel shall be placed around the base of the hydrant in order to provide drainage for the hydrant drain.

All hydrants shall be set plumb and shall have their nozzles parallel with edge of pavement; the pumper connection shall be facing the edge of pavement. Hydrants shall be set to the established grade, with nozzles eighteen (18") inches above the ground or as directed by the OWNER.

All excavation around the fire hydrant and auxiliary valve shall be backfilled to the natural line or finished grade as rapidly as possible. The backfill material shall consist of the excavated material or trench backfill as herein specified.

All backfill material shall be deposited in the excavation in a manner that will not cause damage to the fire hydrant or auxiliary valve. Any depressions which may develop within the area involved in a construction operation due to settlement of backfill material shall be filled in a manner consistent with standard practice.

The fittings, piping and valves for the hydrant shall be provided with restrained joints in addition to the rodded connection and the thrust block behind the base elbow.

Each hydrant shall be painted using Thnemec-Gloss Safety Orange (# E0119) prior to the hydrants being placed in service.

All retainer glands when required to restrain valves, fittings, hydrants, and pipe joints shall be mechanical joint wedge action type MEGALUG 1100 Series as manufactured by EBBA Iron, Inc. or UNI-FLANGE BLOCKBUSTER 1400 SERIES as manufactured by Ford Meter Box Co. and shall be for use on ductile iron pipe conforming to ANSI/AWWA C151/A21.51, for nominal pipe sizes 3" through 48".

Existing ductile iron systems requiring restraint shall be MEGALUG SERIES 1100SD (split MEGALUG) for mechanical joints.

Restraint system for restraining push-on pipe bells shall be MEGALUG SERIES 1100HD or FORD SERIES 1390.

Method of Measurement: Measurement for the installed fire hydrant with auxiliary valve and valve box complete and including all appurtenances shall be measured for payment on a per each basis at each location.

Basis of Payment: This work shall be paid for at the contract unit price per each for FIRE HYDRANT WITH AUXILIARY VALVE AND VALVE BOX, which price shall be considered payment in full for completing this work as specified, including furnishing and installing the fire hydrant with auxiliary valve and valve box, drainage stone, thrust block, appurtenances, backfilling and all labor, tools, equipment and incidental items as shown on the plans and as specified herein to complete this work.

### **GATE VALVE AND VAULT, 8"**

### **GATE VALVE AND VAULT, 12"**

Description: Under this item, the Contractor shall provide all labor, materials and appurtenances necessary to construct gate valves and vaults at the locations shown on the plans and as specified herein.

Gate Valves - Gate valves shall meet the requirements of the latest revision of AWWA C509. Gate valves shall open to the left (counter clockwise) and shall have mechanical joints ends. Gate valves through 16" in diameter shall have resilient seats. Gate valves installed in fire hydrant leads shall have "O" ring stuffing box. Gate valves shall be as manufactured by Clow or Mueller. Stem, indicators, and all working parts shall be fully protected from moisture or weather damage by complete enclosure. Operating nuts shall be bronze. Operating nuts shall be 2 inches square.

Valves shall be installed in accordance with the manufacturer's recommendations. Valves shall be placed on a cast-in-place concrete valve pedestal of the dimensions shown on the drawings. A 1/2" preformed joint filler shall be placed between the valve and the pedestal to facilitate future removal of the valve.

Boxes - Valves boxes shall be Tyler Series 6850 or approved equal.

Vaults - Vaults shall be constructed of precast concrete sections conforming to ASTM C-478 and in accordance to the detail provided on the plans. The frame and lids shall be as indicated in plan detail.

Valve vaults shall be constructed with a precast base section or monolithic base structure as shown on the plans on a compacted 6" sand cushion. All lift holes on precast elements shall be thoroughly wetted and filled with mortar, smoothed inside and out. The first barrel section shall be uniformly supported by the base concrete and shall not bear directly on any of the pipes. Castings shall be set in butyl rope.

Valves shall be installed in accordance with the manufacturer's recommendations.

All nuts, bolts and threaded rods shall be stainless steel.

Method of Measurement: Gate valves and vaults shall be measured on a per each basis by valve diameter in place.

Basis of Payment: This work shall be paid for at the contract unit price per each for GATE VALVE AND VAULT, 12" and GATE VALVE AND VAULT, 8", which price shall be considered payment in full for completing this work as specified, including excavation, bedding, installation and all labor, tools, equipment and incidental items as shown on the plans and as specified herein to complete this work.

#### **LINE STOP, 6"**

#### **LINE STOP, 8"**

Description: This work shall include the installation of line stops at locations shown on the plans or as directed by the Engineer.

Line stops shall be as supplied by TD Williamson or approved equal. Tapping sleeve to be heavy-duty stainless steel or cast iron body construction. Tapping sleeve shall be pressure tested prior to cutting into the existing water main.

Contractor to provide as-built drawings for the buried location of the line stops by providing an elevation to top of blind flange and a minimum of two tie-in points for horizontal control.

Method of Measurement: Measurement for the installed line stops shall be measured for payment on a per each basis at each location.

Basis of Payment: This work shall be paid for at the contract unit price per each for LINE STOP, 8" and LINE STOP, 6", which price shall be considered payment in full for completing this work as specified, including excavation, dewatering, bedding, installation and all labor, tools, equipment and incidental items as shown on the plans and as specified herein to complete this work.

#### **VALVE VAULTS TO BE REMOVED**

Description: This work shall consist of removing existing valve vaults and valve boxes as shown on the plans and as directed by the Engineer. This work shall be completed in accordance with Section 602 of the Standard Specifications for Road and Bridge Construction in Illinois.

This work includes all necessary excavation (except rock excavation), removal of the structure, and proper backfill as specified in Section 602.11.

Valve vaults and valve boxes shall be salvaged where ever possible and returned to City of Naperville Department of Public Works.

Method of Measurement: Measurement for valve vaults to be removed shall be measured for payment on a per each basis at each location shown in the plans.

Basis of Payment: This work shall be paid for at the contract unit price per each for VALVE VAULTS TO BE REMOVED, which price shall be considered payment in full for completing this work as specified, including all labor, material, equipment, and coordination with City personnel necessary to complete this work.

### **ANTI-GRAFFITI COATING**

Description: This item of work shall consist of the application of an Anti-Graffiti Coating to all exposed concrete faces. This work shall be as described herein and as directed by the Engineer.

General: The Contractor shall submit an Anti-Graffiti Coating application plan to the Engineer for approval prior to commencing the work.

Quality Assurance: Prepare a test wall surface with anti-graffiti coating to represent the standard of texture and workmanship for the work. Coat the surface as specified herein and in accordance with the manufacturer's specifications. Allow the coating to cure, apply graffiti as directed by the Engineer, and then remove the graffiti. The cleaned surface shall remain undamaged and shall display no graffiti "shadows" or "ghosts". Do not apply the anti-graffiti coating to the work, described herein, prior to the sample surface being approved by the Engineer. The anti-graffiti coating shall be colorless or shall not cause the concrete to deviate from its natural appearance.

Submittals: In addition to the application plan, the Contractor shall submit the following items to the Engineer for approval:

- Notarized Certificates of Compliance from the coating manufacturer for all coating products installed on the work.
- A list of all material used in the coating system, and all material safety data sheets.
- A notarized certificate confirming that the coating has performed satisfactorily for at least five years in work similar to that specified herein. The certificate shall provide clear concise details on projects with locations and contracts where coating has previously performed.

Products: Use base coat formulated by anti-graffiti coating manufacturer for use with finish coating selected. Base coat shall be clear or pigmented acrylic/urethane based material formulated for application over specified surfaces. Percent solids for the clear base coat shall be minimum of 24 percent. Apply at a rate to provide a minimum dry film thickness of 2.0 mils. Percent solids for the pigmented base coat shall be a minimum of 59 percent. Apply at a rate to provide a minimum dry film thickness of 4.0 mils.

Furnish finish coat as described below and apply over base coat to achieve an additional minimum 2.0 mil dry film thickness.

Provide thinners and dryers as required, and ten gallons of graffiti remover of the type recommended by the coating manufacturer for use by the Department.



Base Coat Application:

1. Apply the base sealer when the ambient temperature is between 7°C and 32°C, the surface temperature is between 10°C and 38°C, and the relative humidity is not greater than 70 percent.
2. Ensure that surface is thoroughly clean and dry before applying base sealer.
3. Mix base sealer according to manufacturer's specifications for 15 minutes prior to application.
4. Apply a base sealer by brush, roller or airless spray. Ensure that areas to be coated are adequately ventilated, and that operators are protected from exposure to fumes and chemicals. Comply with the base sealer manufacturer's recommendations.

Finish Coat Application:

1. Apply the anti-graffiti coats when the ambient temperature is between 7°C and 32°C, the surface temperature is between 10°C and 38°C, and the relative humidity is not greater than 70 percent.
2. Ensure that surface is thoroughly clean and dry before applying anti-graffiti coatings.
3. Apply anti-graffiti coatings by airless spray. Ensure that areas to be coated are adequately ventilated, and that operators are protected from exposure to fumes and chemicals. Comply with the anti-graffiti coating manufacturer's recommendations.

Curing: The curing times shown below are based on an ambient temperature of 24°C and shall be modified for variations in temperatures as recommended by the coating manufacturer.

<u>Stage</u>	<u>Cure Time Hours</u>
After surface preparation and before applying Base Primer	24-48
After Base Primer and before first Finish Coating	24
After Finish Coating and before Graffiti Removal	24

Cleanup:

- A. Clean drippings, runs and smudges from the Finished Work surface with an appropriate solvent as recommended by the coating manufacturer.
- B. Allow 24-hour cure time prior to using Graffiti Remover to remove any graffiti applied to Finished Work.
- C. Provide 1 gallon kit of each finish coat per every 10,000 square feet of surface covered for repairs of minor damage to coating surface.

Method of Measurement: This item of work will be measured for payment in square feet.

**Main Street over the  
West Branch of the DuPage River  
Section: 96-00099-00-BR  
County: DuPage**

Basis of Payment: This item of work will be paid for at the contract unit price per square foot for ANTI-GRAFFITI COATING which price shall include all labor, materials, equipment, and incidentals required to perform the work as described herein and as directed by the Engineer.

**BENCH**

This item shall include furnishing and installing benches at locations indicated on the plans according to the manufacturer's recommendations, details included in the plans, and in accordance with the City of Naperville's Downtown Naperville Streetscape Standards, dated April 2003. Bench shall be 6' backless: Model 92-60 as listed in the Streetscape Standard options. Concrete foundations and the mounting of this item shall be incidental to this item.

This item shall be paid for at the contract unit price EACH for "BENCH." All materials, labor, and equipment necessary to complete the installation of this item shall be included in the cost of this item.

**BRICK PAVERS**

Brick pavers and all related items shall be furnished and installed as shown on the plans per manufacturer's recommendations, and in accordance with the City of Naperville's Downtown Naperville Streetscape Standards, dated April 2003, and included in the contract documents.

The Contractor shall provide all equipment and materials, and do all work necessary to construct the unit paving as indicated on the Drawings and as specified. Drawings and general provisions of Contract, and all other sections of these Special Provisions, apply to this Section. Except as modified herein, the work shall be in accordance with the applicable portions of the Standard Specifications.

The Contractor shall provide evidence (Submitted with his Bid) that his firm or other entity propose for the unit paving work has specific experience meeting the following criteria:

1. Experience installing unit pavers using sand setting beds.

2. Installed (within past three years) a minimum of 100,000 square feet per year for the past three years of unit paving using sand setting beds.
3. The same experienced supervisory personnel will be made available for this project.

The Contractor shall also submit with the bid a list of comparable projects setting forth description, square footage, location and knowledgeable references with addresses and phone numbers.

The Contractor shall submit to the Owner's Representative a minimum of 16 square feet of each type of unit paver for approval. The Submittal shall indicate the full range of unit pavers in the specified color.

The Contractor shall submit manufacturer's technical specifications and data for concrete paver units indicating conformance with specified requirements.

Additionally, the Contractor shall submit manufacturer's technical specifications and data for the plastic edging and sand setting bed indicating conformance with specified requirements:

The Contractor shall execute and deliver to the Owner, before the final payment will be made, a written warranty which guarantees that all unit paver work is in accordance with the Plans and Specifications and without defects. This warranty shall guarantee all labor and materials for three (3) years from the date of acceptance of the work by the Owner:

If another entity other than the Contractor will be responsible for brick paver items, an additional warranty bond by a surety in the amount of \$10,000 satisfactory to the Owner to guarantee the Contractor's warranty to repair or replace defective unit paver work will be required from the entity responsible for the brick items. The warranty bond shall be in addition to the Contractor's performance, payment or other bonds, and shall be delivered to the Owner prior to final payment to the Contractor.

The Contractor shall supply and deliver one (1) extra standard pallet each for all types of pavers (including tactile) used on the project to the Owner upon completion of the work. Pavers shall be new, banded on a pallet, and shall be as shipped from the factory. The Contractor shall deliver and off-load the pavers to a location within the City of Naperville as designated by the Owner. Providing the extra pallet of brick pavers shall not be paid for separately but shall be considered incidental to each type of applicable concrete unit paver.

All material substitutions must be submitted to the Owner's Representative and Owner for review no later than ten (10) days prior to submitting bids. Submittals for consideration shall include full-sized samples and technical specifications. The Owner's Representative will review substitution submittal and, if approved, will issue written approval. Substitution submittals received after time outlined above will not be considered. Substitutions during construction will not be allowed.

During the installation of the paver units and base Contractor shall keep driveways and entrances serving the businesses and homes clear and available to the Owner and the business' employees at all times. Customer access shall be maintained during normal business hours. Contractor shall be responsible for providing temporary structures such as wooden bridges, ramps, or walkways as required to provide the public safe, secure, and recognizable access ways to businesses during construction.

At the completion of the unit paver installation, including all cut pavers, trimming, sanding and other adjustments, the Contractor shall request a review of the installation by the Owner's Representative. The review by the Owner's Representative and Contractor will identify defective and deficient areas which require corrections in the unit paver installation. Defective areas shall be immediately corrected by the Contractor. Defective areas will not be included in pay application quantities until corrective measures are taken. If the unit paver installation is "Substantially Complete" as determined by the Owner's Representative, the warrantee period shall begin. At the end of the warrantee period, the Contractor and Owner will review the unit paver installation and identify defective areas which require correction. Defective items include, but are not limited to, settlement or heaving between pavers and adjacent surfaces where differential exceeds 1/8". If defects develop during the warrantee period and prior to the final inspection, the Owner will contact the Contractor to arrange an interim review of the unit paver installation. Defective paver areas will be repaired by the Contractor immediately.

#### Unit Pavers (Concrete)

Unit pavers shall be of the color, size and shape specified in the City of Naperville's Downtown Naperville Streetscape Standards, dated April 2003. Samples of pavers to be used shall be provided for approval to the City of Naperville prior to ordering.

Tactile pavers shall be as manufactured by "Paveloc", nominal 4.13" x 8.26" x 2.38" in size, grooved as indicated on the detail herein, this section, or approved equal.

Accent pavers shall be as manufactured by "Paveloc", Holland 12 x 12, nominal 12.58" x 12.58" x 2.38" in size.

All pavers shall have a minimum compressive strength of 8,000 PSI and an absorption rate of less than 5% when tested, in accordance with ASTM C140 and C936, and after 50 cycles of freeze-thaw or 3-day application of rock salt (wet) there shall be no weight loss or visual signs of deterioration. The pavers shall have the following major components:

1. Cement: ASTM C-150 Portland Cement, Type 1
2. Aggregates: ASTM C33 (washed, graded sand and natural aggregates, no expanded shale or lightweight aggregates)
3. Additives: Calcium stearates should be added to mix to prevent efflorescence of pavers.
4. Coloring agents: Natural iron oxide pigments.

There shall be no variation in the depth of each paver and pavers shall have a chamfered edge on all top-side edges. Tactile pavers shall be as shown on drawings.

#### Sand Setting Bed

Sand for setting bed shall meet the requirements of Section 1003 of the Standard Specifications for FA-6. Masons sand shall not be used.

### Base Course Material

The base course granular material shall meet the requirements of Section 1004 of the Standard Specifications of CA 6 and shall be constructed to a compacted thickness as described in the plans. Crushed Concrete shall not be used.

### Paver Joint Material

The paver joint material shall be dry sand conforming to ASTM C-144 with all particles passing the No. 16 sieve.

Sand setting beds are used in the installation of different types of pavers used in this contract. All pavers shall be installed per the respective manufacturer's recommendations. No paver setting work shall be performed when the underlayment has free moisture, ice, or snow, or when the underlayment is frozen.

The concrete underlayment shall be sound, clean, and free from debris and materials or substances which will hinder the bond of the setting bed. The top surface of concrete underlayment slab shall not vary more than one half (1/2) inch of its proposed elevation. Concrete shall have cured at least three (3) days.

### Brick Pavers

The Contractor shall make every effort to reduce dust during paver installation and cutting operations. The Contractor is encouraged to shop cut standard shapes required in the installation of the paver system such as standard bevel cuts, angles and other frequently used pieces. If pavers are wet cut, the Contractor shall clean daily adjacent horizontal and vertical surfaces of all slurry, debris and over spray created by wet cutting operations. If pavers are dry cut, an effective dust collection vacuum system must be employed to collect dust at the saw. The Contractor shall maintain such system to optimize its performance by changing or emptying filter bags, or other required activities.

Cut pavers shall be placed in areas shown on the details in the plans. "L" shaped pavers shall be avoided where possible. Pavers shall be cut radially when joints between pavers on curves exceed 1/8 inch. Radial cut pavers shall be created by trimming both sides of paver.

### Base Course

Sub-base granular material base course shall be prepared to compacted depth as indicated on the plans and compacted to 95% at optimum moisture ASTM D698 and D1557 for vehicular areas.

### Sand Setting Bed

Sand shall be spread over granular base as a setting bed for pavers. Sand shall be spread 1½ in. thick, and leveled to required slope and grade. The minimum thickness of sand shall be 1" after leveling. The bed shall not be compacted until pavers are installed.

Surface tolerance shall be within 1/4 in. of the required grade as measured with a 10 ft. straightedge in both the transverse and longitudinal directions.

Setting bed shall be protected from damage prior to setting pavers. Unit pavers shall be set on sand setting bed. Setting shall be done by competent workmen under adequate supervision,

and in accordance with manufacturer's recommendations. Pavers with chips, cracks, or other structural or aesthetic defects or those rejected by the Owner's Representative shall not be used. Pavers shall be set true to the required lines and grades in the pattern detailed on the Plans. Pavers shall be tightly butted. Joints between pavers shall be uniform and shall be 1/8 inch in width. There shall be positive surface drainage with no birdbaths or raised edges (either pavers or materials adjacent to pavers) that could allow someone to trip. The tolerance for such edges shall be 0" - 1/8" maximum in range.

After a sufficient area of pavers has been installed, the pavers shall be compacted by running a mechanical vibratory compactor over the paved surface until the pavers are uniformly leveled, true to grade, and totally immobilized.

Where required, pavers shall be accurately cut with a masonry or concrete saw. Cut edges shall be plumb and straight. Scoring and breaking shall not be acceptable.

Joints between pavers shall be filled by sweeping sharp sand into the joints. When joints are filled, paver surfaces shall be swept clean of sand.

Paver edgings shall be installed per manufacturer's recommendations.

#### Tactile Paver

Tactile pavers shall be installed using sand setting beds as indicated on the plans. Tactile pavers shall be installed in the patterns shown in the details on the plans. Where tactile pavers are installed in straight patterns, the tactile pavers may be installed without cutting. Where tactile pavers are installed on curves pavers shall be cut radially to minimize joints between pavers. The finished tactile paver pattern shall create a series of parallel grooves in the paver surface perpendicular to the direction of pedestrian travel.

After completion of the unit pavers, paver installation areas shall be thoroughly swept clean and surface shall be left unsoiled. Where required by the Owner's Representative, surface shall be cleaned with water or an approved cleaner.

Method of Measurement: The installation of brick pavers shall be measured for payment per square foot measured in place.

Basis of Payment: This work shall be paid for at the contract unit price per square foot for BRICK PAVERS, which price shall be considered payment in full for completing this work, including all labor, materials, and equipment necessary to perform the work as herein specified. Extra material stock to be delivered to the Owner as described above shall be considered incidental and not be paid for separately. Concrete underlayment, specified elsewhere, shall be paid for separately.

#### PCC UNDERLAYMENT, 6"

#### PCC HEADER BANDING

This item shall include the installation of PCC underlayments, header banding, and planter curbing at all locations shown on the plans, as specified in these Special Provisions, and in

accordance with the City of Naperville's Downtown Naperville Streetscape Standards, dated April 2003, and included in the contract documents.

The Contractor shall provide all equipment and materials, and do all work necessary to construct the concrete underlayment for unit pavers, header banding, and planter curbing as indicated on the plans and as specified herein.

The planter curbing shall be jointed as shown on the plans.

This work shall be done as shown on the plans and in accordance with the Standard Specifications for Road and Bridge Construction in Illinois, the City of Naperville standard specifications, and as specified herein.

Adjustments of surface elements, such as, buffalo boxes, valve covers, manhole covers, vault covers, etc. to final grades is covered in other sections of these Special Provisions.

Work for Concrete Header Banding shall conform with Section 424 of the Standard Specifications, except as hereinafter modified or specified. Work for Concrete Underlayment shall conform with Section 420 of the Standard Specifications, except as hereinafter modified or specified. Work for Concrete Planter Curbing shall conform with Section 606 of the Standard Specifications, except as hereinafter modified or specified.

The Contractor shall submit manufacturer's data for approval by the Owner's Representative. The Contractor shall also submit a concrete mix report and joint sealant color samples for approval by the Owner's Representative.

The Contractor shall construct a minimum 10' sample(s) of the planter curbing indicating typical turns, finish and jointing. Sample(s) shall be constructed separate from actual work and the final approved sample shall remain in place until directed by the Owner's Representative. The sample shall be reviewed by the Owner's Representative and approved before proceeding with further curbing construction. No actual planter curbing construction shall commence until a sample has been approved.

Concrete shall not be placed when air temperature is 45 degrees F and falling. Placement will be permitted if air temperature is 40 degrees F and rising.

The Contractor shall be required to provide storage space, meeting the approval of the Owner's Representative, for the initial curing of quality control test specimens made on the project. The storage space shall be such that it will give full protection against direct sunlight, the elements, pilfering and damage. When requested by the Owner's Representative, heat shall be provided by the contractor, with a minimum temperature of 60 degrees Fahrenheit maintained for as long as required.

The Contractor shall protect adjacent surfaces from concrete splash and other drainage. Contractor shall immediately clean, repair or replace adjacent surfaces to original condition or better after installation on new concrete surfaces.

The Contractor shall maintain access to building entrances, drives and alleys during concrete work. Customer access shall be maintained during normal business hours. Contractor shall be responsible for providing temporary structures such as wooden bridges, ramps, or walkways as required to provide the public safe, secure, and recognizable access ways to businesses during construction.

Underlayments and banding for driveways and streets shall be staged to maintain vehicular and pedestrian traffic to the greatest degree possible.

#### Concrete

Concrete shall be in accordance with Article 720 of the Standard Specifications and with City of Naperville standard specifications, having a minimum 14-day strength of 3500 psi.

Concrete for underlayment and header banding shall be Class PV high early strength concrete with a minimum strength of 3500 psi at three (3) days.

#### Joint Sealant

Joint sealants shall be a one-part non-priming, non-tacking, polyurethane joint sealant with leveling properties suitable to the use intended, as manufactured by Sonneborn Division of Chemrex Inc. or approved equal. The color shall be selected by the Owner's Representative.

#### Joint Cap

The Joint cap shall be as manufactured by The Burke Company, (800) 423-9140, or approved equal.

#### Joint Filler Material

Joint filler material shall be a non-extruding asphalt-impregnated fiber board of a width as specified on the Drawings and in accordance with Article 1051 of the Standard Specifications. Joint filler shall extend from the bottom of the slab to within 1 inch of the top of the joint.

#### Dowel Rod

Dowel rods used for doweled expansion joints shall be smooth steel rod of the size specified on the Drawings. One end of the rod shall be sleeved to permit free movement within one side of the slab or other concrete component.

#### Base Course Granular Material

Material shall be crushed stone having a CA-6 gradation conforming to Section 1004 of the Standard Specifications.

#### Reinforcement

Reinforcing bars shall conform to ASTM A615, Grade 60. The welded wire mesh shall be welded plain cold-drawn steel wire fabric conforming to ASTM A185. The steel wire shall conform to ASTM A82 and be of the size indicated on the plans.

The existing subgrade shall be thoroughly compacted prior to installation of the sub-base granular material. Sub-base granular material shall be installed in accordance with these specifications and to the compacted depth indicated on the drawings.

Protective coat shall be applied as specified herein to all poured concrete except underlayment.



### Concrete Underlayments and Header Banding

Forms shall be oiled prior to placing concrete. All pavements and underlayments shall have a minimum cross slope of 1/4 inch per foot or as indicated on the plans. Concrete shall be placed in one course construction of the specified thickness.

The surface of all Concrete Header Banding shall have a light broom finish. The surface of Concrete Underlayment shall have a rough broom finish.

### Expansion and Isolation Joints

Premolded joint filler shall be installed with attached joint caps where indicated on the plans and not be more than 50 feet apart and where new concrete work abut vertical surfaces, walks, and other existing concrete construction. Joint fillers and joint caps shall be extended to the full width and depth of the joint. Joint fillers shall be furnished in one-piece lengths for the full width of slab to be placed, wherever possible. The top edge of the joint cap shall be formed to conform to the top profile of concrete.

The concrete shall be tooled with a slight radius on each side of joint cap. After the concrete has cured sufficiently, remove top half of joint cap.

The sealant shall be installed as indicated on the plans per manufacturer's recommendations and specifications to fill space created by joint cap to top of concrete.

Joint caps and sealants shall not be installed in expansion and isolation joints for Underlayments.

The surface shall be divided using control joints of the depth and configuration indicated on the drawings. The surface shall be divided by control joints extending to 1/3 the depth of the slab. Control joints shall be tooled first, then sawcut to proper depth and shall be spaced at intervals indicated on the drawings. All edges of header banding shall be shaped with an edging tool having a radius as indicated on the drawings.

Concrete pours shall be ended at expansion or control joints. Partial slabs shall not be allowed.

### Planter Curbing

The planter curbing shall be constructed as indicated on the drawings and as specified herein. All top edges of the planter curbing shall have a radius as indicated on the drawings. The planter curbing shall have a light vertical brushed finish after an initial smooth troweling. Discontinuous concrete pours shall be ended with doweled expansion joints. Partial sections shall not be allowed.

The concrete shall be colored as specified in the Downtown Naperville Streetscape Standards, and the cost of the coloring shall be included in the bid price for this item.

### Protective Coat

Protective coat shall be applied to all concrete surfaces. This work shall be performed in accordance with Article 420.21 of the Standard Specifications, except that the coating shall be applied regardless of when the item being coated was constructed.

Cleanup shall be performed in accordance with Section 424.10 of the Standard Specifications.

All concrete shall be cured for not less than seven (7) days after placement. All surfaces shall be protected from sun with membrane curbing compounds. During hot weather, the temperature of the concrete shall be kept below 90 degrees F. During cold weather, the temperature of the concrete shall be kept between 50 degrees F and 70 degrees F for 3 to 5 days. The concrete shall be protected from frost and rapid drying for 6 days. Warning barricades shall be properly erected to prevent premature loading or tracking of fresh concrete.

Method of Measurement: The installation of concrete underlayment shall be measured for payment per square foot measured in place. The installation of concrete header banding and concrete planter curbing shall be measured for payment per foot measured in place.

Basis of Payment: The installation of concrete underlayment shall be paid for at the contract unit price per square foot for CONCRETE UNDERLAYMENT, 6", which price shall be considered payment in full for completing this work, including all labor, materials, and equipment necessary to perform the work as herein specified.

The installation of concrete header banding shall be paid for at the contract unit price per foot for PCC HEADER BANDING, which price shall be considered payment in full for completing this work, including all labor, materials, and equipment necessary to perform the work as herein specified.

The installation of concrete planter curbing shall be paid for at the contract unit price per foot for PCC PLANTER CURBING, COLORED, which price shall be considered payment in full for completing this work, including all labor, materials, and equipment necessary to perform the work as herein specified.

All joint fillers, caps and sealant, dowel rods and reinforcing for each of the above items shall be considered incidental to the unit price and shall not be paid for separately. This work shall also include the base course granular material where specified, and all labor, equipment and materials necessary to perform the work as herein specified.

### **REMOVE AND RESET BRICK SIDEWALK**

Description: This work shall include all materials, labor and equipment necessary to properly remove, store and reset existing brick paver sidewalk to match the new concrete work, which may be at a slightly different location and elevation than those removed. The reset brick shall be set at slopes that are A.D.A. specification compliant. If additional new brick must be brought in, it shall match the existing brick as closely as possible and at no additional compensation in cost.

During the installation of the paver units and base, the Contractor shall maintain pedestrian and business access at all times. Customer access shall be maintained during normal business hours. Contractor shall be responsible for providing temporary structures such as wooden bridges, ramps or walkways as required to provide the public safe, secure and recognizable access ways during construction.

The Contractor shall make every effort to reduce dust during paver installation and cutting operations.

Method of Measurement: Remove and reset brick sidewalk shall be measured for payment in square feet.

Basis of Payment: This work shall be paid for at the contract unit price per square feet for REMOVE AND RESET BRICK SIDEWALK, which price shall be considered payment in full for completing this work as specified, including all material, labor, equipment and incidental items as shown on the plans and as specified herein to complete this work.

### **CONCRETE CURB (SPECIAL)**

General: Work under this item shall be performed in accordance with Section 606 of the Standard Specifications as herein modified, and with the details shown on the plans for Concrete Curb (Special).

Description: This work shall consist of constructing Concrete Curb (Special) on the southeast corner of Main Street and Chicago Avenue as shown on the plans and/or as directed by the Engineer.

The new curb face shall align with the proposed bridge railing and match into the proposed sidewalk grading as shown on the plans.

Concrete shall not be placed on soft, muddy, frozen or non-compacted subgrade or subbase. Preparation of the sub-grade or sub-base shall not be paid for separately but considered included in this item unless otherwise noted on the plans. Concrete shall be Class SI conforming to the requirements of Section 1020 of the Standard Specifications.

Method of Measurement: Concrete Curb (Special) shall be measured for payment per foot, measured along the face of the curb.

Basis of Payment: This work shall be paid for at the contract unit price per foot for CONCRETE CURB (SPECIAL), which price shall be considered payment in full for completing this work as specified, including subgrade preparation, transitions to match grades shown on the plans and all material, labor, equipment and incidental items as shown on the plans and as specified herein to complete this work.

### **ENTRY COLUMN**

#### **Description:**

This work shall consist of furnishing and installing stone finishes and specialty signs for the bridge entry columns. The stone finishes and specialty signs will be installed on the concrete column specified in the contract plans. Cast in place concrete for these columns shall follow the applicable portions of Section 503 of the Standard Specifications.

The work includes:

1. Column stone veneer
2. Column cast stone base, caps and columns
3. Mortar and accessories
4. Internally lit banner sign
5. Bronze plaques

General:

Refer to Special Provision STONE FINISHES FOR COLUMN for stone veneer and cast stone specifications.

**QUALITY ASSURANCE**

- A. Installation: performed only by experienced workers with satisfactory record of performance on completed projects of comparable size and quality.
- B. Sign Fabricator to be licensed per applicable State and municipal requirements.
- C. Sign cabinet to be UL listed and fabricated to meet all applicable BOCA and municipal codes.
- D. Sign Fabricator to submit shop drawings including all connection methods, internal lighting, materials, sizing and text.
- E. Plaque text to be provided by City of Naperville prior to fabrication. Submit mock-ups of all plaques including text to City of Naperville for approval prior to fabrication.
- F. Fabricate banner sign and plaques as indicated or as accepted and detailed on final shop drawings. Provide stainless steel accessories, connections fasteners and supports as shown and as necessary to secure the work in place.

**DELIVERY, STORAGE, AND HANDLING**

- A. Deliver, store, and handle sign and plaque materials to prevent damage.

**PROJECT CONDITIONS**

- A. Protect adjacent work from damage, soiling, and staining during operations.

**MATERIALS**

- A. Banner Sign:
  - 1. Supplied by: Custom fabricated by Design Group Signage Corporation, 847-390-0350 -- or equal qualified sign fabricator
  - 2. Cabinet: aluminum cabinet, .100 thick with routed face panel. Letters to be 1/2" clear acrylic push-through with white vinyl on face of letters. 1/8" translucent white acrylic backing. Font: Albertus MT.
  - 3. Lighting: Internally lit with (2) CWHO fluorescent lamps per side, staggered to illuminate evenly. Provide cold weather ballast. Provide junction boxes as required.
  - 4. Size: See plans for specific dimensions
  - 5. Surface Finish: Powder coat finish,
  - 6. Color: To be similar to PMS 484C (red) as approved by Owner's Representative Red.

- B. Plaques:
1. Supplied by: Elgin Granite Works, 847-888-4190 – or approved equal
  2. Material/ Finish: Cast bronze, black pebble finish background w/  
polished lettering and detailing
  3. Size: See plans for specific dimensions
  4. Text: Specific text to be provided by City of Naperville prior to  
fabrication

## INSTALLATION

- A. Examine column construction prior to beginning work. Do not start sign and plaque work until unsatisfactory conditions are corrected.
- B. Set banner sign and plaques in accordance with drawing details and final shop drawings. Provide anchors, supports, and other attachments shown, or necessary to secure the work in place.
- C. Erect work plumb and true with joints uniform in width and accurately aligned.
- D. Signage fabricator to coordinate with electrical contractor for specific requirements of internally lit banner sign, conduit, junction box and ballast placement. Electrical contractor to provide for (2) 20 amp circuits.

## CLEANING

- A. Upon completion of the work, remove from site all excess materials, debris, tools, and equipment. Repair damage resulting from construction operations.

Method of Measurement: Measure ENTRY COLUMN on a per each (column) basis, including all labor, equipment and materials necessary to complete column stone veneer, column cast stone base, caps and columns, mortar and accessories, internally lit banner sign, and bronze plaques.

Basis of Payment: The ENTRY COLUMN, measured as specified, will be paid for at the contract unit price per each for ENTRY COLUMN. These prices shall be payment in full for all labor, materials, equipment, and manufacturer's technical support required for preparation and installation.

## STONE FINISHES FOR COLUMN

### Description:

This work shall consist of furnishing and installing stone finishes for the bridge ornamental column. The stone finishes will be installed on the concrete column specified in the contract plans. Cast in place concrete for these columns shall follow the applicable portions of Section 503 of the Standard Specifications.

The work includes:

1. Column stone veneer.
2. Column cast stone base.
3. Column cast stone cap.
4. Mortar.

General:

QUALITY ASSURANCE

- A. Stone veneer standards:
  - 1. Limestone: Comply with ASTM C568, Specifications for dimensions Limestone and following physical characteristics:
    - a. Wisconsin (Racine Dolomitic) limestone, Grade A.
    - b. Absorption: ASTM C97, 1.36% maximum.
    - c. Compressive strength: ASTM C170, 32,000 psi minimum.
- A. Cast stone standards:
  - 1. Cast Stone Institute Technical Manual (current addition).
- C. Installation: performed only by experienced workers with satisfactory record of performance on completed projects of comparable size and quality.
- D. All stone to be furnished from a single quarry to ensure consistent color range and texture to match existing stone wall. Samples to be presented to Owner's Representative for approval.
- E. Shop drawings for all stone items shall be submitted for approval by the Owner's Representative.

DELIVERY, STORAGE, AND HANDLING

- A. Stone masonry materials:
  - 1. Deliver, store, and handle stone materials to prevent damage.
- B. Masonry accessories: Deliver, store, and handle masonry accessories to prevent weather damage and deterioration.
- C. Mortar materials:
  - 1. Deliver cement, lime, and admixture materials in manufacturer's unopened and undamaged containers with labels intact and legible. Store materials off the ground, under cover, and protect from weather damage and deterioration.
  - 2. Stockpile and handle aggregates to prevent mixing with foreign materials.

PROJECT CONDITIONS

- A. Do not use metal accessories with loose rust or other coatings, including ice, which will reduce bond.
- B. Protect partially-completed masonry work against weather damage and moisture, when work is not in progress. Cover tops of walls with strong, waterproof, non-staining membrane. Extend membrane at least 2'-0" down both sides of walls and hold securely in place.
- C. Cold weather construction:
  - 1. Precondition stone masonry materials to maintain minimum 50 degree F. temperatures when installed.
  - 2. Protect stone masonry from freezing when the temperatures of the outside air is 40 degrees F. and falling. Heat materials and provide temporary protection of completed portions of stone masonry work. Comply with BIA "Construction and Protection Recommendations for Cold Weather Masonry Construction" and NCMA "TEK Bulletin No. 16A."
  - 3. No stone masonry work will be permitted when outside air temperature is below 25 degrees F.
  - 4. Do not use frozen materials or materials mixed or coated with ice or frost.

5. Do not build on frozen work. Remove and replace stone masonry work damaged by frost or freezing.
  6. Do not use anti-freeze or calcium chloride in any mortar.
  7. Protect completed stone masonry work against freezing for not less than 4 days after laying.
- D. Protect sills, ledges, and projections from mortar droppings. Remove excess mortar and stains as work progresses.
- E. Protect adjacent work from damage, soiling, and staining during stone masonry work operations.

Materials:

- A. Column stone veneer:
1. Quarried/supplied by: Halquist Stone Company  
Sussex, WI (800) 255-8811 - or approved equal.
  2. Color/Type: Brookfield Blend Lannon Veneer
  3. Surface finish: Brookfield Blend - 70% Splitface (50% Grey, 50% Buff) & 30% Bedface (100% Grey)
  5. Size: Splitface 2"-8", Bedface 5"-12", nominal 4" depth, random length.
  6. Grade/quality: Standard grade free of cracks, seams or starts which may impair its structural integrity or function.
- B. Column cast stone base, Column cast stone cap:
1. Supplied by: Thunderstone Architectural Cast Stone Products, Available through Building Stone Products, Lemont, IL 630-257-9220 - or approved equal.
  2. Finish/ color: Dry cast limestone, natural color and texture.
  3. Size: See plans for specific products and dimensions

**MORTAR MATERIALS**

- A. Masonry cement: ASTM C91, white nonstaining type
- B. Aggregate: ASTM C144, clean masonry sand, 100% passing #16 sieve.
- C. Water: Clean, fresh, and potable.
- D. Water repellent admixture: Ammonium stearate, aluminum tristearate or calcium stearate.

Construction:

**STONE MORTAR MIXES**

- A. Provide water repellent admixture in all mortar used for stone masonry work. Add to mix in accordance with manufacturer's recommendations. Maximum 2% by weight of portland cement content of mortar.
- B. Setting mortar: 1 part nonstaining masonry cement, 1 part hydrated lime, and 6 parts damp loose sand.
- C. Pointing mortar: same as Setting mortar.
- D. Measure and batch materials either by volume or weight. Use accurate measuring devices to ensure uniformity and coloration of mix. Shovel count measurement of sand is not acceptable.
- E. Mix cementitious materials and aggregate in a clean mechanical mixer for at least 5 minutes. Add water in amount to provide satisfactory workable consistency of mortar.

## CAST STONE FABRICATIONS

- A. Fabricate stone work as indicated or as accepted and detailed on final shop drawings. Provide holes and sinkages cut or drilled for anchors, fasteners, supports, and lifting devices as shown and as necessary to secure stone work in place. Cut and back-check for proper fit and clearance. Shape beds to fit supports.
- B. Cut accurately to shape and dimensions indicated or accepted final shop drawings.
  - 1. Dress joints, bed, and vertical, straight at 90 degree angle to face. Provide drips and washes as indicated.
  - 2. Joint width: Cut to allow 1/2" wide joints.
  - 3. Thickness: Provide thickness indicated. Saw-cut back surfaces concealed in the finished work.
  - 4. Jointing: Provide as indicated; when not indicated, in accordance with industry standards and practices.

## INSPECTION

- A. Examine substrates and installation conditions. Do not start stone work until unsatisfactory conditions are corrected.

## PREPARATION

- A. Establish layout.
- B. Do not use stone units with chips, cracks, voids, stains or other visible defects.

## INSTALLATION

- A. Select stone at the job site and install materials to provide an even distribution of various colors, sizes and shapes throughout the Work.
- B. As work progresses, build in items furnished by other trades. Fill in solidly with masonry around built-in items.
- C. Set stone in accordance with drawing details and final shop drawings for stone work. Provide anchors, supports, and other attachments shown, or necessary to secure stonework in place. Shim and adjust accessories as required for proper setting of stone. Completely fill holes, slots, and sinkages with mortar during setting.
- D. Erect cut stone work plumb and true with joints uniform in width and accurately aligned. Cross-shaped joints in the random ashlar pattern and joints more than three stone in length will not be accepted.
- F. Wall facing: Set cut stone work in full beds of mortar with vertical joints buttered full. Provide setting pads and shims in same thickness as joints and in sufficient quantity to maintain uniform 1/2" wide and 1/2" deep joint width and alignment of stone units. Provide a concave tooled exposed joint surface.
- E. Copings: Set wall and column copings in full bed of mortar. Provide a concave tooled exposed joint surface to match wall facing. Pitch to drain.

## CLEANING

- A. Remove and replace stone units which are loose, broken, stained, or otherwise damaged. Provide new matching units, install as specified, and point-up joints to eliminate evidence of replacement. Repoint defective and unsatisfactory joints and as required to provide a neat, uniform appearance.



- B. Clean stonework not less than 6 days after completion of work, using clean water and stiff-bristle brushes. Do not use wire brushes, acid type cleaning agents or other cleaning compounds with caustic or harsh fillers.
- C. Cleaning agents and methods shall be acceptable to the Owner's Representative.
- D. Upon completion of the work, remove from site all excess materials, debris, tools, and equipment. Repair damage resulting from stone masonry work operations.

Method of Measurement: Measure STONE FINISHES FOR COLUMN on a per each (column) basis, including all labor, equipment and materials necessary to complete column stone veneer, column cast stone base and column cast stone cap.

Basis of Payment: The column stone finishes, measured as specified, will be paid for at the contract unit price per each for STONE FINISHES FOR COLUMN. These prices shall be payment in full for all labor, materials, equipment, and manufacturer's technical support required for preparation and installation.

## PLANTER

### Description:

This work shall consist of furnishing and installing cast stone planters on the bridge column. The planters will be installed on the concrete column specified in the contract plans. Cast in place concrete for these columns shall follow the applicable portions of Section 503 of the Standard Specifications. Other stone finishes for the column with planters shall follow the Special Provision STONE FINISHES FOR COLUMN. The planters are to be attached to the concrete columns using a minimum of 2 stainless steel anchor bolts drilled and grouted into the concrete column a minimum of 6 inches. The diameter and number of anchor bolts shall be per the manufacturer's recommendations. A stainless steel plate will be set between the planter and anchor bolt washers to distribute the bolt forces evenly over the bottom of planter. The dimension of the stainless steel plate shall be per the manufacturer's recommendations. All stainless steel hardware shall meet the requirements of Section 1006.31 of the Standard Specifications.

The work includes:

- A. Cast Stone Planter
- B. Mortar and Accessories

### General:

## QUALITY ASSURANCE

- A. Materials and methods of construction shall comply with the following standards and association recommendations:
  - 1. Cast Stone Institute Technical Manual (current addition).
- B. Installation: performed only by experienced workers with satisfactory record of performance on completed projects of comparable size and quality.
- C. Shop drawings for all cast stone planters shall be submitted for approval by the Owner's Representative.

## DELIVERY, STORAGE, AND HANDLING

- A. Planters:

1. Deliver, store, and handle stone materials to prevent damage.
- B. Planter installation accessories: Deliver, store, and handle planter accessories to prevent weather damage and deterioration.
- C. Mortar materials:
  1. Deliver cement, lime, and admixture materials in manufacturer's unopened and undamaged containers with labels intact and legible. Store materials off the ground, under cover, and protect from weather damage and deterioration.
  2. Stockpile and handle aggregates to prevent mixing with foreign materials.

#### PROJECT CONDITIONS

- A. Do not use metal accessories with loose rust or other coatings, including ice, which will reduce bond.
- B. Cold weather installation:
  1. Precondition stone masonry materials to maintain minimum 50 degree F. temperatures when installed.
  2. Protect stone masonry from freezing when the temperatures of the outside air is 40 degrees F. and falling. Heat materials and provide temporary protection of completed portions of stone masonry work. Comply with BIA "Construction and Protection Recommendations for Cold Weather Masonry Construction" and NCMA "TEK Bulletin No. 16A."
  3. No stone masonry work will be permitted when outside air temperature is below 25 degrees F.
  4. Do not use frozen materials or materials mixed or coated with ice or frost.
  5. Do not build on frozen work. Remove and replace stone masonry work damaged by frost or freezing.
  6. Do not use anti-freeze or calcium chloride in any mortar.
  7. Protect completed stone masonry work against freezing for not less than 4 days after laying.

#### Materials:

- B. Planter:
  1. Supplied by: Longshadow Planters, 618-893-4831 – or approved equal.
  2. Type: Glencoe 34 w/ square base 24.
  3. Finish/ Color: Dry cast limestone, natural color and texture.
  4. Size: 34" diameter with 24" square base.

#### MORTAR MATERIALS

- A. Masonry cement: ASTM C91, white nonstaining type
- B. Aggregate: ASTM C144, clean masonry sand, 100% passing #16 sieve.
- C. Water: Clean, fresh, and potable.
- D. Water repellent admixture: Ammonium stearate, aluminum tristearate or calcium stearate.

#### Construction:

#### MORTAR MIXES

- A. Provide water repellent admixture in all mortar used for stone masonry work. Add to mix in accordance with manufacturer's recommendations. Maximum 2% by weight of portland cement content of mortar.

- B. Setting mortar: 1 part nonstaining masonry cement, 1 part hydrated lime, and 6 parts damp loose sand.
- C. Pointing mortar: same as Setting mortar.
- D. Measure and batch materials either by volume or weight. Use accurate measuring devices to ensure uniformity and coloration of mix. Shovel count measurement of sand is not acceptable.
- E. Mix cementitious materials and aggregate in a clean mechanical mixer for at least 5 minutes. Add water in amount to provide satisfactory workable consistency of mortar.

#### PLANTER FABRICATION

- A. Fabricate stone work as indicated or as accepted and detailed on final shop drawings. Provide holes and sinkages cut or drilled for anchors, fasteners, supports, and lifting devices as shown and as necessary to secure stone work in place. Cut and back-check for proper fit and clearance. Shape beds to fit supports.
- B. Cut accurately to shape and dimensions indicated or accepted final shop drawings.
  - 1. Dress joints, bed, and vertical, straight at 90 degree angle to face. Provide drips and washes as indicated.
  - 2. Joint width: Cut to allow 1/2" wide joints.
  - 3. Thickness: Provide thickness indicated. Saw-cut back surfaces concealed in the finished work.
  - 4. Jointing: Provide as indicated; when not indicated, in accordance with industry standards and practices.

#### INSPECTION

- A. Examine substrates and installation conditions. Do not start planter installation until unsatisfactory conditions are corrected.

#### PREPARATION

- A. Establish layout.
- B. Do not use stone planters with chips, cracks, voids, stains or other visible defects.

#### INSTALLATION

- A. As work progresses, build in items furnished by other trades. Fill in solidly with masonry around built-in items.
- B. Set planters in accordance with drawing details and final shop drawings for planters and other stone finishes for column work. Provide anchors, supports, and other attachments shown, or necessary to secure planters in place. Shim and adjust accessories as required for proper setting of planters. Completely fill holes, slots, and sinkages with mortar during setting.
- E. Erect planters plumb and true with joints uniform in width and accurately aligned.
- F. Set planters in full bed of mortar.

#### CLEANING

- A. Remove and replace planter units which are loose, broken, stained, or otherwise damaged.

- B. Clean stonework not less than 6 days after completion of work, using clean water and stiff-bristle brushes. Do not use wire brushes, acid type cleaning agents or other cleaning compounds with caustic or harsh fillers.
- C. Cleaning agents and methods shall be acceptable to the Owner's Representative.
- D. Upon completion of the work, remove from site all excess materials, debris, tools, and equipment. Repair damage resulting from stone masonry work operations.

Method of Measurement: Measure PLANTER on a per each basis, including all labor, equipment and materials necessary to fabricate and install stone column planters.

Basis of Payment: The planters, measured as specified, will be paid for at the contract unit price per each for PLANTER. These prices shall be payment in full for all labor, materials, equipment, and manufacturer's technical support required for preparation and installation.

### **TOPSOIL (PLANTING MIXTURE)**

This item shall include furnishing and installing topsoil fill for all planters as shown on the plans, as specified in these Special Provisions, and in accordance with the City of Naperville's Downtown Naperville Streetscape Standards, dated April 2003, and included in the contract documents. Any excavation necessary to complete the work as specified herein shall be included in the bid price for this item.

Submit certified copies of Topsoil Agronomic Test Reports to the Architect, including the testing company's recommendations for amending topsoil to meet project specifications. The Contractor shall engage an approved agronomic soil testing laboratory and an approved physical analysis testing laboratory. The cost of testing shall be the responsibility of the Contractor. All agronomic soil sampling and testing shall comply with procedures specified in the USDA Ag. Handbook 60: Diagnosis and improvement of Saline and Alkali Soils.

The following tests shall be required:

1. Chemical analysis indicating:
  - a. Fertility: pH, nitrate nitrogen, ammonia nitrogen, phosphate phosphorous, potassium, calcium, magnesium.
  - b. Nutrient data to be given in parts per million (ppm).
2. Physical properties including:
  - a. Organic content
  - b. Particle size distribution
  - c. Saturated hydraulic conductivity in one hour.

### **Topsoil**

Topsoil which has been stripped from on-site shall not be utilized as topsoil on the project.

Topsoil required for this project shall be a fertile, friable, loamy surface soil without admixture of subsoil and free of stones, stumps, root, trash, debris, and other materials deleterious to plant growth. The pH range shall be 6.5 to 8.4. Topsoil that does not meet this pH range will be amended by the addition of pH adjusters approved by the City Engineer. The nutrient data of the topsoil shall be as follows:

Phosphorus	Min. 75 lb./Ac
Potassium	Min. 300 lb./Ac
Calcium	Min. 1,500 ppm
Magnesium	Min. 100 ppm
Cation Exchange Capacity	Min. 20 mea/100g
Soluble Salt	Max. 1,000 ppm

Organic content of the topsoil shall not be less than 3 percent and not greater than 10 percent determined by loss through ignition.

All topsoil shall be 'pulverized' and meet the following gradation requirements:

<u>Sieve Designation</u>	<u>Percent Passing</u>
1" screen	100
1/4" screen	97 - 100
No. 10 U.S.S. mesh sieve	95 - 100
No. 140 U.S.S.	60 - 90
No. 270 U.S.S.	25 - 50

The clay content as determined by Bouyoucous Hydrometer Test shall range between 5 percent and 20 percent. The percentages shall be based on dry weight of the sample.

If topsoil amendments are required as determined by the testing lab in order to meet project specifications, incorporate such amendments in a manner approved by the City Engineer at no additional cost to the Owner.

Planting mixture for all trees over 1" in caliber shall be amended with "root" growth/acclimator, application rate, per manufacturer.

Method of Measurement: Furnishing and installing topsoil for planters will be measured for payment per cubic yards in place.

Basis of Payment: The work shall be paid for at the contract unit price per cubic yard for the placement of TOPSOIL (PLANTING MIXTURE), which price shall include all costs for supply, labor, materials, equipment, and incidentals necessary to perform the work.

### TREES, SHRUBS, GRASSES, PLUGS AND GROUNDCOVERS

This work shall consist of the furnishing and installation of plant materials, soil treatments and plant maintenance as indicated on the plans and specified herein.

Materials and installation will be as specified in "Appendix B, Landscaping".

Symbol designation shown on the plans will be as listed in the table below:

Latin Name	Common Name	Symbol	Size	Spacing	Quantity/ Area
<b>TREES</b>					
Nyssia sylvatica	Black Tupelo	BT	3"	See plans	3
Alnus incana	Gray alder	GA	3"	See plans	3
Hammamelis virginiana	Common Witchhazel	WH	3"	See plans	1
<b>SHRUBS</b>					
Clethra alnifolia	Summer Sweet	SS	5 gallon	3' o.c.	7
Rosa rugosa alba	White rugosa rose	RA	5 gallon	3' o.c.	11
Symphoricarpos alba	Snowberry	SB	5 gallon	3' o.c.	9
Ilex glabra	Inkberry	IG	5 gallon	3' o.c.	13
Aronia melanocarpa	Black chokeberry	AR	5 gallon	5' o.c.	7
<b>GRASSES</b>					
Carex muskingumensis	Palm Sedge	PS	1 gallon	2' o.c.	20
Panicum virgatum	Switchgrass	SG	3 gallon	3' o.c.	15
<b>PLUGS</b>					
Scirpus validus	Soft stem bulrush	See plans	3" pot	1' o.c.	30
Spartina pectinata	Cordgrass	See plans	3" pot	1' o.c.	30
Carex lanuginose	Wooly Sedge	See plans	3" pot	1' o.c.	30
Juncus torreyi	Torrey's rush	See plans	3" pot	1' o.c.	30
Scirpus atrovirens	Dark Green rush	See plans	3" pot	1' o.c.	30
Juncus effusus	Common bullrush	See plans	3" pot	1' o.c.	30
Panicum virgatum	Switch grass	See plans	3" pot	1' o.c.	30
Carex cosmosa	Prairie dropseed	See plans	3" pot	1' o.c.	30
Calamagrostis canadensis	Blue Joint grass	See plans	3" pot	1' o.c.	30

Carex vulpinoidea	Fox sedge	See plans	3" pot	1' o.c.	30
<b>GROUNDCOVER</b>					
Parthenocissus quinquefolia	Virginia creeper	See plans	3" pot	1' o.c.	200sf
Erosion control blanket C125 BN	C125 BN	See plans			500sf

Basis of Payment: The work shall be paid for at the contract unit price per: each for TREES of the type and size specified; each for SHRUBS of the type and container size specified; each for GRASSES of the type and container size specified, each for PLUGS of the type and container size specified; square foot for GROUNDCOVER of the type and container size specified; and square foot of EROSION CONTROL BLANKET C125 BN.

### **STAMPED ASPHALT CROSSWALK**

This item includes the stamping and staining (including base, pigment, and sealant) of the asphalt pavement in the areas described in the plans. The contractor doing the work shall be an Authorized StreetPrint Applicator as licensed by Integrated Paving Concepts Inc. and shall have a foreman, supervisor or lead hand on site who has successfully completed a StreetPrint Level 1 Accreditation Program.

This pay item shall include all necessary pavement scarification, application of prime coat, stamping and staining (including base, pigment and sealer) of the crosswalk as detailed in the plans.

Layout and imprint the pattern into the surface of the pavement shall be as per the drawings or specifications. Imprinting can proceed immediately after the hot asphalt has been placed and compacted, while the asphalt is still in a warm to hot pliable state. Alternatively, imprinting can be carried out at a later stage, on existing asphalt, by applying heat to the asphalt surface to make the upper portion of the asphalt surface pliable enough to accept the imprint of the template. The application of heat to existing asphalt surface shall be done using re-heating equipment, such as infrared heaters or hot air heaters. Overheating of the asphalt shall not be permitted. Direct flame heaters shall not be used for the purpose of heating the asphalt. The temperature of the asphalt surface shall be regularly monitored during the reheating process, to avoid overheating and degradation of the asphalt cement.

Alternatively, imprinting can be carried out at a later stage, on existing asphalt, by applying heat to the asphalt surface to make the upper portion of the asphalt surface pliable enough to accept the imprint of the template.

For proper imprinting success, the asphalt pavement must be adequately heat soaked (softened) to a depth of at least ½ inch (12.5mm), without burning the asphalt. The asphalt surface temperature shall not exceed 300 °F (150°C). If smoke is visible, that is an indication that the asphalt is burning and the pavement may spall or crumble at a later date. Regular monitoring of the surface temperature during heating is recommended to prevent over heating.

The pattern shall be herringbone with a soldier course border and shall be approved by the Engineer. The Contractor shall follow the latest StreetPrint Application Procedures as issued by Integrated Paving Concepts Inc. The pattern shall be created in accordance with the design as agreed by the Engineer. Patterning shall begin once the asphalt has reached its final density and while there is still sufficient heat in the asphalt to permit imprinting. Patterning shall be achieved using steel rollers and/or vibratory plate compactors and shall be of consistent depth.

The Contractor shall apply the "StreetBond Surfacing System" as specified below in the materials section. The air temperature should be at least 50°F (10°C) and rising for applying the StreetBond Surfacing System. There should be no precipitation expected within 24 hours after applying StreetBond SP 50 Base, or within 2 hours after StreetBond SP 100 has dried. Drying time is significantly affected by environmental conditions.

Installation shall be in accordance with the latest StreetPrint Application Procedures as issued by Integrated Paving Concepts Inc. The StreetBond products shall be spray applied and broomed using a broom or brushes to cut in small areas where required.

The Engineer shall specify the number of applications of the "StreetBond Surfacing System" that will be installed. See "Guidelines for Specifying the Number of Coating Applications" below.

When StreetBond SP 50 has fully dried, StreetBond Sealer Concentrate will be applied as a curing membrane. StreetBond Sealer Concentrate may be tinted using StreetBond colorant, and shall be spray applied and broomed into the surface. Care shall be taken to ensure that the entire surface is covered, including the vertical edges of the imprinted surfaces. Sufficient masking shall be used to ensure that the surfacing products are applied only where specified.

The products used in the surfacing system shall meet the minimum physical and performance properties described in the following "StreetBond Surfacing System" Product Descriptions and Specifications.

#### "StreetBond Surfacing System" Product Descriptions and Specifications

(i) StreetBond SP 50 Base:

StreetBond SP 50 Base is a cement modified, acrylic polymer and aggregate blend developed specifically for use over imprinted asphalt. It is characterized by superior adhesion, flexibility and abrasion resistance as well as chemical resistance and good scrubability. This combination of characteristics is required of a StreetPrint application. One application of StreetBond SP 50 Base will provide a surface build between 10 – 15 mils (0.25 – 0.4 mm). (For physical and performance properties see Tables 1 & 2.)

(ii) StreetBond SP 100 Base:

StreetBond SP100 base is a blend of acrylic resins and aggregates having similar properties to StreetBond SP 50 Base, except that it has been specially formulated to cure without the use of cement, and will not effloresce. It can therefore be applied in less favorable climatic conditions.

(iii) StreetBond Base Coat Filler/Traffic Supplement:



StreetBond Base Coat Filler consists of a special blend of aggregates and manufactured fines, which is added to the StreetBond SP 50 base, and used to fill voids, segregation or an open texture in the asphalt surface, prior to the application of StreetBond SP 50 or SP 100 base coat.

(iv) StreetBond Sealer Concentrate:

StreetBond Sealer Concentrate is a breathable, high quality, acrylic polymer, clear sealer designed specifically for use with the StreetBond SP 50 Base. StreetBond Sealer Concentrate can also be used with StreetBond SP 100 Base if a "high gloss" appearance is desired. When applied over the StreetBond SP 50 Base, StreetBond Sealer Concentrate provides a breathable sealing membrane, which adds both durability and longevity to the SP 50 Base. It is absolutely necessary to seal StreetBond SP 50 Base with StreetBond Sealer Concentrate. (For physical properties see Table 1.)

(v) StreetBond Colorant:

StreetBond Colorant is a highly concentrated, high quality, UV stable pigment blend designed to be added to StreetBond SP 50 and SP 100 Base. The StreetBond Colorant shall be Terracotta.

Table 1 Physical Properties  
"StreetBond SP 50 and SP 100 Base"

Characteristic	Test Specification	StreetBond SP 50 Base	StreetBond SP 100 Base	StreetBond Sealer Concentrate
Solids by Volume (%)	ASTM D-2697	66.8%	68.3 %	24 +/-2
Solids by Weight (%)	ASTM D-2369	80.1%	76.5%	27+/-2
Density	ASTM D-1475	14.6 lbs./gal (1.75 kg/l)	14.04 lbs./gal (1.67 kg/l)	8.59 lbs./gal (1.03 kg/l)
Flash Point	ASTM D-3278	>200oF (93oC)	>230oF (110oC)	> 200°F (93°C)
Percent Pigment (by weight including cement)	ASTM D-3723	62 +/- 2%	61.9%	N/A
Sheen	ASTM D-523	< 3 @ 85o		> 75 @ 85°

Table 2 Performance Properties:  
"StreetBond Surfacing System"

Characteristics	Test Specification	Test Results StreetBond SP 50 Base	Test Results StreetBond SP 100 Base
Dry Time (to re-coat)	Gardner Circular meter	43 mins.	27 mins
Dry Time (for traffic) 75°F/30%RH	N/A	≅ 80% strength @ 6-8Hrs.	≅ 80% strength @ 2-4Hrs
Taber Abrasion H-10(Dry Wear Index)	ASTM D-4060	0.3385 grams/1000 cycles after 7 days cure	0.2 grams/1000 cycles after 7 days cure
Adhesion (PLI) To an Asphalt substrate	ASTM D-4541	Cohesive failure of asphalt prior to adhesive failure	Cohesive failure of asphalt prior to adhesive failure
QUV ΔE	ASTM G154	300 hours 2.21 CIE units	300 hours 0.7 CIE units
Hydrophobicity (9days immersion)	ASTM D-570	11.1% wt. gain	15.4% wt gain
Shore Hardness	ASTM D-2240	82 Type D	88 Type D
Temperature Limits for Service	Dry, cured material	-30°F to 160°F	-30°F to 140°F
Surface Build	N/A	10 – 15 mils (1 application)	10 – 15 mils (1 application)

**Method of Measurement:** Stamped asphalt crosswalk shall be measured for payment in square yards, which will be calculated by the length and width of the crosswalk restored including borders. Measurement shall be considered full compensation for stamping, staining, installation of border, traffic control, and any other labor, equipment, tools or materials necessary to complete this item to the satisfaction of the Engineer.

**Basis of Payment:** This work shall be paid for at the contract unit price per square yard for STAMPED ASPHALT CONCRETE, which shall be full compensation for stamping, staining, installation of border, and all materials, labor, equipment and appurtenant necessary for a complete job. No deduction will be made for the area(s) occupied by manholes, inlets, and drainage structures or by any public utility appurtenances within the area. Payment for the placement of the bituminous pavement prior to stamping shall be paid separately as specified in the plans.

### **TURBIDITY CURTAIN**

This work shall consist of furnishing, installing, maintaining, and removing the turbidity curtain as shown on the plans.

The materials shall meet the following requirements:

1. Barriers should be a bright color (yellow or "international" orange are recommended) that will attract the attention of nearby boaters.

2. The curtain fabric must meet the minimum requirements noted in the following table:

**GEOTEXTILE TURBIDITY CURTAINS**

Minimum Average Roll Properties  
Belton-150

<u>PROPERTY</u>	<u>TEST METHOD</u>	<u>UNITS</u>	<u>RESULTS</u>
Weight	<b>ASTM D-3776</b>	<b>OZ/SY</b>	6
Tensile Strength	<b>ASTM D-4632</b>	<b>LBS</b>	360/260
Elongation @ Break	<b>ASTM D-4632</b>	<b>%</b>	15
Trapezoidal Tear	<b>ASTM D-4833</b>	<b>LBS</b>	110/65
Mullen Burst	<b>ASTM D-3786</b>	<b>PSI</b>	490
Puncture Strength	<b>ASTM D-4833</b>	<b>LBS</b>	145
A.O.S.	<b>ASTM D-4751</b>	<b>SIEVE</b>	70
Permittivity	<b>ASTM D-4491</b>	<b>SEC-1</b>	0.29
Water Flow Rate	<b>ASTM D-4491</b>	<b>GPM</b>	19-21
UV Resistance @ 500 Hours	<b>ASTM D-4355</b>	<b>%</b>	90

Oct. 20, 1996

Note: All numbers are based on certified values provided by manufacturers.

3. Seams in the fabric shall be either vulcanized welded or sewn, and shall develop the full strength of the fabric.
4. Flotation devices shall be flexible, buoyant units contained in an individual flotation sleeve or collar attached to the curtain. Buoyancy provided by the flotation units shall be sufficient to support the weight of the curtain and maintain a freeboard of at least 3 inches above the water surface level.
5. Load lines must be fabricated into the bottom of all floating turbidity curtains. The top load line shall consist of woven webbing or vinyl-sheathed steel cable and shall have a break strength in excess of 4,500 kilograms (10,000 pounds). The bottom load line shall consist of a chain incorporated into the bottom hem of the curtain of sufficient weight to serve as ballast to hold the curtain in a vertical position. Additional anchorage shall be provided as necessary. The load lines shall have suitable connecting devices which develop the full breaking strength for connecting to load lines in adjacent sections.
6. External anchors may consist of wooden or metal stakes 50 x 100 millimeters (2 x 4 inch) or 60 millimeter (2.5-inch) minimum diameter wood or 2 kilogram per linear meter steel (1.33 pounds/linear foot).

The turbidity curtain shall be installed when the stream is at a low flow rate as follows:

1. In calm water it is usually sufficient to merely set the curtain end stakes or anchor points, then tow the curtain in the furled condition out and attach it to these stakes or anchor points. Following this, any additional stakes or buoyed anchors required to maintain the

desired location of the curtain may be set and these anchor points made fast to the curtain. The furling lines should be cut to let the curtain skirt drop.

2. Always attach anchor lines to the flotation device, not to the bottom of the curtain. The anchoring line attached to the flotation device on the downstream side will provide support for the curtain. Attaching the anchors to the bottom of the curtain could cause premature failure of the curtain due to the stresses imparted on the middle section of the curtain.

After the work is complete and during times when a high flow rate is expected, the turbidity curtain shall be removed.

1. Care should be taken to protect the skirt from damage as the turbidity curtain is dragged from the water.
2. The site selected to bring the curtain ashore should be free of sharp rocks, broken cement, debris, etc., so as to minimize damage when hauling the curtain over the area.
3. If the curtain has a deep skirt, it can be further protected by running a small boat along its length with a crew installing furling lines before attempting to remove the curtain from the water.

#### Maintenance

1. The Contractor shall be responsible for maintenance of the filter curtain for the duration of the project in order to ensure the continuous protection of the watercourse.
2. Should repairs to the geotextile fabric become necessary, there are normally repair kits available from the manufacturers; manufacturer's instructions must be followed to ensure the adequacy of the repair.
3. When the curtain is no longer required as determined by the inspector, the curtain and related components shall be removed in such a manner as to minimize turbidity.

The method of measurement shall be in square yards in place.

The basis of payment will be paid at the contract unit price per square yard for TURBIDITY CURTAIN.

#### **GENERAL ELECTRICAL REQUIREMENTS**

Effective: March 1, 2003

Add the following to Article 801 of the Standard Specifications:

"Maintenance transfer and Preconstruction Inspection:

General. Before performing any excavation, removal, or installation work (electrical or otherwise) at the site, the Contractor shall request a maintenance

transfer and preconstruction site inspection, to be held in the presence of the Engineer and a representative of the party or parties responsible for maintenance of any lighting and/or traffic control systems which may be affected by the work. The request for the maintenance transfer and preconstruction inspection shall be made no less than seven (7) calendar days prior to the desired inspection date. The maintenance transfer and preconstruction inspection shall:

Establish the procedures for formal transfer of maintenance responsibility required for the construction period.

Establish the approximate location and operating condition of lighting and/or traffic control systems which may be affected by the work

Marking of Existing Cable Systems. The party responsible for maintenance of any existing lighting and/or traffic control systems at the project site will, at the Contractor's request, mark and/or stake, once per location, all underground cable routes owned or maintained by the State. A project may involve multiple "locations" where separated electrical systems are involved (i.e. different controllers). The markings shall be taken to have a horizontal tolerance of at least 304.8 mm (one (1) foot) to either side.. The request for the cable locations and marking shall be made at the same time the request for the maintenance transfer and preconstruction inspection is made. The Contractor shall exercise extreme caution where existing buried cable runs are involved. The markings of existing systems are made strictly for assistance to the Contractor and this does not relieve the Contractor of responsibility for the repair or replacement of any cable run damaged in the course of his work, as specified elsewhere herein. NOTE THAT THE CONTRACTOR SHALL BE ENTITLED TO ONLY ONE REQUEST FOR LOCATION MARKING OF EXISTING SYSTEMS AND THAT MULTIPLE REQUESTS MAY ONLY BE HONORED AT THE CONTRACTOR'S EXPENSE. NO LOCATES WILL BE MADE AFTER MAINTENANCE IS TRANSFERRED, UNLESS IT IS AT THE CONTRACTOR'S EXPENSE.

Condition of Existing Systems. The Contractor shall conduct an inventory of all existing electrical system equipment within the project limits, which may be affected by the work, making note of any parts which are found broken or missing, defective or malfunctioning. Megger and load readings shall be taken for all existing circuits which will remain in place or be modified. If a circuit is to be taken out in its entirety, then readings do not have to be taken. The inventory and test data shall be reviewed with and approved by the Engineer and a record of the inventory shall be submitted to the Engineer for the record. Without such a record, all systems transferred to the Contractor for maintenance during construction shall be returned at the end of construction in complete, fully operating condition."

Delete the last paragraph of Article 801.06 of the Standard Specifications.

Revise the 7<sup>th</sup> and 8<sup>th</sup> paragraphs of Article 801.08 of the Standard Specifications to read:

"Engineer's Stamp. After the Engineer reviews the submittals for conformance with the design concept of the project, the Engineer will stamp the drawings indicating their status as 'Approved', 'Approved-As-Noted', 'Disapproved', or

'Information Only'. Since the Engineer's review is for conformance with the design concept only, it is the Contractor's responsibility to coordinate the various items into a working system as specified. The Contractor shall not be relieved from responsibility for errors or omissions in the shop, working, layout drawings, or other documents by the Department's approval thereof. The Contractor must still be in full compliance with contract and specification requirements.

Resubmittals. All submitted items reviewed and marked 'APPROVED AS NOTED', or 'DISAPPROVED' are to be resubmitted in their entirety with a disposition of previous comments to verify contract compliance at no additional cost to the state unless otherwise indicated within the submittal comments."

Revise Article 801.12 of the Standard Specifications to read:

"Lighting Operation and Maintenance Responsibility. The scope of work shall include the assumption of responsibility for the continuing operation and maintenance the of existing, proposed, temporary, sign and navigation lighting, or other lighting systems and all appurtenances affected by the work as specified elsewhere herein."

Add the following to Section 801.12 of the Standard Specifications:

"Energy and Demand Charges. The payment of basic energy and demand charges by the electric utility for existing lighting which remains in service will continue as a responsibility of the Owner, unless otherwise indicated. Unless otherwise indicated or required by the Engineer duplicate lighting systems (such as temporary lighting and proposed new lighting) shall not be operated simultaneously at the Owner's expense and lighting systems shall not be kept in operation during long daytime periods at the Owner's expense. Upon written authorization from the Engineer to place a proposed new lighting system in service, whether the system has passed final acceptance or not, (such as to allow temporary lighting to be removed), the Owner will accept responsibility for energy and demand charges for such lighting, effective the date of authorization. All other energy and demand payments to the utility shall be the responsibility of the Contractor until final acceptance."

Add the following to Section 801 of the Standard Specifications:

"Splicing of Lighting cables. Splices above grade, such as in poles and junction boxes, shall have a waterproof sealant and a heat-shrinkable plastic cap. The cap shall be of a size suitable for the splice and shall have a factory-applied sealant within. Additional seal of the splice shall be assured by the application of sealant tape or the use of a sealant insert prior to the installation of the cap. Either method shall be assured compatible with the cap sealant. Tape sealant shall be applied in not less than one half-lapped layer for a length at least 6.35 mm (1/4-inch) longer than the cap length and the tape shall also be wrapped into the crotch of the splice. Insert sealant shall be placed between the wires of the splice and shall be positioned to line up flush or extend slightly past the open base of the cap.

Lighting Cable Identification. Each wire installed shall be identified with its complete circuit number at each termination, splice, junction box or other location where the wire is accessible.

Lighting Cable Fuse Installation. Standard fuse holders shall be used on non-frangible (non-breakaway) light pole installations and quick-disconnect fuse holders shall be used on frangible (breakaway) light pole installations. Wires shall be carefully stripped only as far as needed for connection to the device. Over-stripping shall be avoided. An oxide inhibiting lubricant shall be applied to the wire for minimum connection resistance before the terminals are crimped-on. Crimping shall be performed in accordance with the fuse holder manufacturer's recommendations. The exposed metal connecting portion of the assembly shall be taped with two half-lapped wraps of electrical tape and then covered by the specified insulating boot. The fuse holder shall be installed such that the fuse side is connected to the pole wire (load side) and the receptacle side of the holder is connected to the line side.

Grounding of Lighting Systems. All electrical systems, equipment and appurtenances shall be properly grounded in strict conformance with the NEC, even though every detail of the requirements is not specified or shown. Good ground continuity throughout the electrical system shall be assured. All electrical circuit runs shall have a continuous equipment grounding conductor. IN NO CASE SHALL THE EARTH BE CONSIDERED AS AN ADEQUATE EQUIPMENT GROUNDING PATH. Where connections are made to painted surfaces, the paint shall be scraped to fully expose metal at the connection point and serrated connectors or washers shall be used. Where metallic conduit is utilized as the equipment grounding conductor, extreme care shall be exercised to assure continuity at joints and termination points. No wiring run shall be installed without a suitable equipment ground conductor. Where no equipment ground conductor is provided for in the plans and associated specified pay item, the Contractor is obligated to bring the case to the attention of the Engineer who will direct the Contractor accordingly. Work which is extra to the contract will be paid extra. All connections to ground rods, structural steel, reinforcing steel or fencing shall be made with exothermic welds. Where such connections are made to insulated conductors, the connection shall be wrapped with at least 4 layers of electrical tape extended 152.4 mm (six inches) onto the conductor insulation. Where a ground field of "made" electrodes is provided, the exact locations of the rods shall be documented by dimensioned drawings as part of the Record Drawings. Equipment ground wires shall be bonded, using a splice and pigtail connection, to all boxes and other metallic enclosures throughout the wiring system.

Lighting Unit Identification. Each pole, light tower and underpass light shall be labeled as indicated in the plans to correspond to actual circuiting, and as designated by the Engineer. They shall be installed by the Contractor on each lighting unit pole shaft and on the underpass walls, or piers, as shown in the details. Median-mounted poles shall have two sets of identification labeling oriented to allow visibility from travel in either direction. Lighting Controllers shall also be identified by means identification decals as described herein. Identification shall be in place prior to placing the equipment in service. Identification of weathering steel poles shall be made by application of letters and numerals as specified herein to an appropriately sized 3.175 mm (1/8-inch) thick stainless steel plate which shall be banded to the pole with two stainless steel bands.

Identification of painted poles shall be made by application of letters and numerals as specified herein via an adhesive approved by the paint manufacturer for the application. Identification of luminaires which are not pole mounted, such as underpass luminaires, shall be done using identification brackets. In general, the brackets shall be mounted adjacent to and within one foot of their respective luminaires. The brackets shall be fabricated from 3.175 mm (one-eighth (1/8)) inch aluminum alloy sheet according to the dimensions shown on the plans. The bracket shall be bent so as to present the luminaire identification numbers at a sixty (60) degree angle to the wall. The bracket shall be attached to concrete walls with three (3) 6.35 mm (1/4 inch), self drilling, snap-off type galvanized steel concrete anchors set flush with the wall, or power driven fasteners approved by the Engineer. The brackets shall be offset from the wall with 12.7 mm (1/2") aluminum bushings. The structural steel shall not be drilled to attach the brackets. The luminaire identification numbers shall be applied to the bracket using the method described for identification applied to poles.

## **GROUND ROD**

Effective: January 1, 1997

**Description.** This item shall consist of furnishing, installing and connecting ground rods for the grounding of service neutral conductors and for supplementing the equipment grounding system via connection at poles or other equipment throughout the system. All materials and work shall be in accordance with Article 250 of the NEC.

**Materials.** Materials shall be according to the following Articles of Section 1000 - Materials

Item	Article/Section
(a) Ground Rod.....	1085.04(a)(2)
(b) Copper Ground Wire.....	1085.25

## **CONSTRUCTION REQUIREMENTS**

**General.** All connections to ground rods, structural steel or fencing shall be made with exothermic welds. Where such connections are made to insulated conductors, the connection shall be wrapped with at least 4 layers of electrical tape extended 152.4 mm (six inches) onto the conductor insulation.

Ground rods shall be driven so that the tops of the rod are 609.6 mm (24 inches) below finished grade. Where indicated, ground wells shall be included to permit access to the rod connections.

Where indicated, ground rods shall be installed through concrete foundations.

Where ground conditions, such as rock, preclude the installation of the ground rod, the ground rod may be deleted with the approval of the Engineer.



Where a ground field of "made" electrodes is provided, such as at control cabinets, the exact locations of the rods shall be documented by dimensioned drawings as part of the Record Drawings.

Ground rod connection shall be made by exothermic welds. Ground wire for connection to foundation steel or as otherwise indicated shall be stranded uncoated bare copper in accordance the applicable requirements of ASTM Designation B-3 and ASTM Designation B-8 and shall be included in this item. Unless otherwise indicated, the wire shall not be less than No. 2 AWG.

Where connections are made to epoxy coated reinforcing steel, the epoxy coating shall be sufficiently removed to facilitate the exothermic weld.

**Method Of Measurement.** Ground rods shall be counted, each. Ground wires and connection of ground rods at poles shall be included in this pay item.

**Basis Of Payment.** This item shall be paid at the contract unit price each for **GROUND ROD**, of the diameter and length indicated which shall be payment in full for the material and work described herein.

#### **UNDERGROUND RACEWAYS**

Effective: January 1, 2002

Revise Article 810.03 of the Standard Specifications to read:

"Installation. All underground conduit shall have a minimum depth of 700 mm (30-inches) below the finished grade."

Add the following to Article 810.03 of the Standard Specifications:

"All metal conduit installed underground shall be Rigid Metal Conduit unless otherwise indicated on the plans."

#### **TRENCH AND BACKFILL FOR ELECTRICAL WORK**

Effective: January 1, 2002

Revise the first sentence of Article 815.03(a) of the Standard Specifications to read:

"Trench. Trenches shall have a minimum depth of 760 mm (30 in.) or as otherwise indicated on the plans, and shall not exceed 300 mm (12 in.) in width without prior approval of the Engineer."

Revise Article 1066.05 of the Standard Specifications to read:

"**Underground Cable Marking Tape.** The tape shall be 150 mm (6 in.) wide; consisting of 0.2 mm (8 mil) polyethylene according to ASTM D882, and ASTM D2103.

The tape shall be red with black lettering or red with silver lettering reading "CAUTION – ELECTRICAL LINE BURIED BELOW".

The tape shall have reinforced metallic detection capabilities consisting of a woven reinforced polyethylene tape with a metallic core or backing."

#### **YELLOW WARNING TAPE OVER STREET LIGHT CABLE**

This work shall consist of placing 4 inch wide yellow warning tape over the street light duct at all locations where new cable is placed by the Contractor. The warning tape shall be placed 1 foot (12") below grade in accordance with Naperville Standard Detail ELECTRIC 9.

This work shall be considered incidental to "TRENCH AND BACKFILL FOR ELECTRICAL WORK".

#### **WIRE AND CABLE**

Effective: January 1, 2002

Revise the second sentence of the first paragraph of Article 1066.02(a) to read:

"The cable shall be rated at a minimum of 90°C dry and 75°C wet and shall be suitable for installation in wet and dry locations, and shall be resistant to oils and chemicals."

Revise the second paragraph of Article 1066.02(b) to read:

"Uncoated conductors shall be according to ASTM B3, ICEA S-95-658/NEMA WC70, and UL Standard 44. Coated conductors shall be according to ASTM B 33, ASTM B 8, ICEA S-95-658/NEMA WC70 and UL Standard 44."

Revise the third paragraph of Article 1066.02(b) to read:

"All conductors shall be stranded. Stranding meeting ASTM B 8, ICEA S-95-658/NEMA WC70 and UL Standard 44. Uncoated conductors meeting ASTM B 3, ICEA S-95-658/NEMA WC70 and UL Standard 44."

Revise the first sentence of Article 1066.03(a)(1) to read:

"General. Cable insulation designated as XLP shall incorporate cross-linked polyethylene (XLP) insulation as specified and shall meet or exceed the requirements of ICEA S-95-658, NEMA WC70, U.L. Standard 44."

Add the following to Article 1066.03(a)(1) of the Standard Specifications:

"The cable shall be rated 600 volts and shall be UL Listed Type RHH/RHW/USE."

Revise the Aerial Electric Cable Properties table of Article 1066.03(a)(3) to read:

Aerial Electric Cable Properties

Phase Conductor		Messenger wire			
Size AWG	Stranding	Average Insulation Thickness		Minimum Size AWG	Stranding
		mm	mils		
6	7	1.1	(45)	6	6/1
4	7	1.1	(45)	4	6/1
2	7	1.1	(45)	2	6/1
1/0	19	1.5	(60)	1/0	6/1
2/0	19	1.5	(60)	2/0	6/1
3/0	19	1.5	(60)	3/0	6/1
4/0	19	1.5	(60)	4/0	6/1

Revise the first paragraph of Article 1066.03(b) to read:

"EPR Insulation. Cable insulation shall incorporate ethylene propylene rubber (EPR) as specified and the insulation shall meet or exceed the requirements of ICEA S-95-658, NEMA Standard Publication No. WC70, and U.L. Standard 44, as applicable."

Add the following to Article 1066.03(b) of the Standard Specifications:

"Cable sized No. 2 AWG and smaller shall be U.L. listed Type RHH/RHW and may be Type RHH/RHW/USE. Cable sized larger than No. 2 AWG shall be U.L. listed Type RHH/RHW/USE."

Revise Article 1066.04 to read:

"Aerial Cable Assembly. The aerial cable shall be an assembly of insulated aluminum conductors according to Section 1066.02 and 1066.03. Unless otherwise indicated, the cable assembly shall be composed of three insulated conductors and a steel reinforced bare aluminum conductor (ACSR) to be used as the ground conductor. Unless otherwise indicated, the code word designation of this cable assembly is "Palomino". The steel reinforced aluminum conductor shall conform to ASTM B-232. The cable shall be assembled according to ANSI/ICEA S-76-474."

Revise the second paragraph of Article 1066.05 to read:

"The tape shall have reinforced metallic detection capabilities consisting of a woven reinforced polyethylene tape with a metallic core or backing."

Revise Article 1066.08 to read:

"Electrical Tape. Electrical tape shall be all weather vinyl plastic tape resistant to abrasion, puncture, flame, oil, acids, alkalies, and weathering, conforming to Federal Specification MIL-I-24391, ASTM D1000 and shall be listed under UL 510 Standard. Thickness shall not be less than 0.215 mm (8.5 mils) and width shall not be less than 20 mm (3/4-inch)."

#### **MAINTAIN EXISTING SHEPHERDS LIGHTING DURING CONSTRUCTION**

This item shall consist of maintaining the existing lighting on Main Street and along riverwalk. Relocate existing controller to utility service pole location, extend three circuits to provide temporary feeds, and connect the existing remaining Sheppard's poles. Install and maintain temporary conductors, and remove when no longer necessary when reconnected by new work.

This work will be paid for at the contract unit price lump sum to "MAINTAIN EXISTING SHEPHERDS LIGHTING DURING CONSTRUCTION".

#### **ELECTRIC SERVICE INSTALLATION**

Description: This item shall consist of all material and labor required to extend, connect or modify the electric services, as indicated or specified, which is over and above the work performed by the utility. Unless otherwise indicated, the cost for the utility work, if any, will be reimbursed to the Contractor separately under ELECTRIC SERVICE CONNECTION. This item may apply to the work at more than one service location and each will be paid separately.

Materials. Materials shall be according to the following Articles of Section 1000 - Materials

Item	Article/Section
(a) Electric Service Installation - Lighting	1086.01

#### **CONSTRUCTION REQUIREMENTS**

General: The Contractor shall ascertain the work being provided by the electric utility and shall provide all additional material and work required to complete the electric service work in complete compliance with the requirements of the utility.

No additional compensation will be allowed for work required for the electric service, even though not explicitly shown on the Drawings or specified herein

Method Of Measurement: Electric Service Installation shall be counted, each.

Basis Of Payment: This work will be paid for at the contract unit price each for ELECTRIC SERVICE INSTALLATION, which shall be payment in full for the work specified herein.

### **ELECTRIC UTILITY SERVICE CONNECTION**

Description: This item shall consist of payment for work performed by the Electric Utility Company in providing or modifying electric service as indicated. THIS MAY INVOLVE WORK AT MORE THAN ONE ELECTRIC SERVICE.

#### **CONSTRUCTION REQUIREMENTS**

General: It shall be the Contractor's responsibility to contact the utility. The Contractor shall coordinate his work fully with the electric utility both as to the work required and the timing of the installation. No additional compensation will be granted under this or any other item for extra work caused by failure to meet this requirement.

The Contractor should make particular note of the need for the earliest attention to arrangements with the utility for service. In the event of delay by the utility, no extension of time will be considered applicable for the delay unless the Contractor can produce written evidence of a request for electric service within 30 days of execution.

Method Of Payment: The Contractor will be reimbursed to the exact amount of money as billed by the Electric Utility Company for its services. Work provided by the Contractor for electric service will be paid separately as described under ELECTRIC SERVICE INSTALLATION. No extra compensation shall be paid to the Contractor for any incidental materials and labor required to fulfill the requirements as shown on the plans and specified herein.

For bidding purposes, this item shall be estimated as \$5,000

Basis Of Payment: This work will be paid for at the contract lump sum price for ELECTRIC UTILITY SERVICE CONNECTION, which shall be reimbursement in full for electric utility service charges.

### **JUNCTION BOX EMBEDDED IN STRUCTURE**

This work shall be performed in accordance with Section 813 of the Standard Specifications with the following provisions:

The junction box shall be stainless steel in accord with Article/Section 1088.44 of size indicated.

This work will be paid for at the contract unit price per EACH for "JUNCTION BOX EMBEDDED IN STRUCTURE" of the type and size indicated.

### **HANDHOLE (SPECIAL)**

Work shall include furnishing and installing composite concrete junction box in accordance with the provisions of 1085.18 of the Standard Specifications and connecting conduits into the

junction box. The size shall be a minimum of 11" x 18" x 18" deep PC Style gasketed box with open base. The junction box shall be a:

1. 4 bolt cover by Quixote Compolsolite with a design load of 8000# or greater, or,
2. 2 bolt cover by Synertech with a design load of 10,000# or greater,

unless otherwise specified in the plans and approved by engineer. The cover shall bear a legend of "STREET LIGHTING". There shall be no holes cut into the sides of the junction box without approval from the Engineer.

This work will be paid for at the contract unit price per EACH for "HANDHOLE (SPECIAL)".

#### **LIGHTING STANDARD, SODIUM VAPOR, ACORN, 100 WATT**

Furnish and installing lighting standards at the specified mounting height, and luminaries per the quantities specified in the contract in accordance with IDOT Standard Specifications for Road and Bridge Construction, Adopted January 1, 2002, in accordance with Section 821 and 830, and as described in the Special Provisions herein.

Poles shall be giving the specified mounting height as indicated on drawing above the roadway to the luminaire, meeting the specifications set forth in IDOT of the specified length fastened to the poles by with stainless steel bolts, nuts, and lockwashers.

During shipment to and storage at the site of the work, the pole shall be carefully shipped in bundles without any wrapping on the individual shafts or the entire bundle. Appropriate bundling materials shall be used to make a rigid, long-lasting bundle capable of being handled, shipped, and stored without shifting or breaking of contents.

Luminaire Truss Arm: The Truss arm shall be aluminum alloy tube, round, seamless, conforming to the current ASTM Designation B221 and Designation 6063-T6. The arm shall be supplied with fabricated aluminum brackets welded to the arms. All welds shall be heat treated after welding. The fastening of the arms to the pole shaft shall be by stainless steel bolts, nuts, and lockwashers for a single arm and for a truss type arm, with four 1/2 inch stainless steel bolts, nuts, and lockwashers on the upper member and two on the lower. Unless otherwise specified, the rise of the mast arm shall be (22 inches).

The luminaire shall meet the applicable requirements of Section 821 of the Standard Specifications for Road and Bridge Construction, January 1, 2002.

This item shall include the furnishings of the luminaries complete with pole wire, fusing, bolts, nuts, and all incidentals necessary to complete the installation.

The luminaire shall accommodate one high-pressure sodium lamp of the specified wattage. The optical system shall be factory preset to deliver IES distribution pattern type 3 unless otherwise specified. Photometric curves shall be supplied as part of the submittal for approval. Location of the luminaries shall be as specified by the engineering plans. The luminaries shall be capable of fulfilling the requirements of ANSI/IES RP-8, 1983 American National Standard Practice for Roadway Lighting, for residential roadway with Type 3 surface.

The 100 watt h.p.s. Luminaire shall be: Architectural Area Lighting complete with drawing indicated accessories.

Lamps: The high pressure sodium lamps shall be of clear finish, be heat and shock resistant, and be capable of operating in a horizontal burning position, and shall meet the applicable requirements of Article 1067.02 of the Standard Specifications.

Electrical materials shall be new and of the type and kind meeting the requirements of the National Electrical Safety Code. The street lighting standard, complete in place, shall include the pole with bolts, arm of the length specified herein, luminaire with lamp and ballast, pole wiring, fuses and fuse holders, all nuts, bolts and incidentals necessary to complete the lighting unit assembly as shown in the detail of the pole installation.

Pole Wire: This item shall consist of furnishing, installing, and connecting a 3-1/C No. 10 AWG Sol 600 volt insulated copper conductor from the luminaire terminal blocks to the pole handhole per 1066.09 for wire between the underground distribution system and the luminaire in a moisture proof manner. The wire is to run inside the pole and arm.

Fuse Holders and Fuses: Also included in this item are the furnishing and installation of in-line fuse holders) and fusels) on all leads in accordance with 1065.01 of the standard specifications. The fuse holder to be used shall be finished and sized as required, and each fuse holder shall be complete with a 13/32" x 1 1/2" fuse, rated at 20 amps, Type KTK. Fuse holder shall be Tron HEB-AW-RLC-A 30A 600V.

This work shall be paid for at the Contract unit price per EACH for **"LIGHTING STANDARD, SODIUM VAPOR, ACORN, 100 WATT"**, at the specified mounting height with the specified luminaire.

#### **POLE WIRE, 1/C -#10 XLP/USE-2**

This item shall consist of furnishing, installing, and connecting 1/C No. 10 AWG 600 volt insulated copper conductor, USE-2/XLP, stranded in conformance with ASTM B-8 from the luminaire terminal blocks to the pole hand hole per Sections 822 and 1085.06 for Roadway Lighting pole wire between the underground distribution system and the luminaire in a moisture-proof manner. Connection of pole wire to the terminals in the street lighting luminaire is incidental to the installation of the pole wire.

- A. Pole wire shall be insulated with cross-linked polyethylene, (XLP) insulation jackets of black (or red) and white colored insulation. The wire is to run inside the pole. Three (3) 1/C - #10 pole wire conductors in black, white, and green color will be used. The green conductor will be connected to the ground lug of the luminaire and to the ground lug/ground cable in the base of the pole.

**SPLICING OF LIGHTING CABLES** shall be incidental to the installation of electrical cable in conduit. The pole wire will be measured for payment in feet. Measurements will only include the mounting height plus the length of the mast arm or span as indicated on the plans and/or in the specifications.

This work will not be paid separately, but shall be considered included in the contract unit price per EACH for **"LIGHTING STANDARD, SODIUM VAPOR, ACORN, 100 WATT"**.

### **LIGHTING CABLE FUSE KITS**

Furnishing and installation of In-line fuse holder(s) and fuse(s) on all leads shall be in accordance with Article 1085.03 of the standard specifications and as follows:

- A. Fuse holders of the in-line quick disconnect breakaway type shall be used on all light pole installations in the base of each lighting standard. The fuse holder shall have a minimum rating of 30 amps. and be sized for 13/32" x 1 1/2" fuses. Fuse holder shall be Edison HEB-AW-RLC-A 30A 600V for load/line and HET-AW-RLC-A for neutral or equal as approved by Engineer.
- B. Wires shall be carefully stripped only as far as needed for connection to the device. Over-stripping shall be avoided. An oxide inhibiting lubricant shall be applied to the wire for minimum connection resistance before the terminals are crimped-on.
- C. Crimping shall be performed in accordance with the fuse holder manufacturer's recommendations.
- D. The exposed metal connecting portion of the assembly shall be taped with two half-lapped wraps of electrical tape and then covered by the specified insulating boot.
- E. The fuse holder shall be installed such that the fuse side is connected to the pole wire (load side) and the receptacle side of the holder connected to the line side.
- F. In-line fuse holder(s) shall be provided on all neutral conductors with a solid slug in place of the fuse in the base of each lighting standard.
- G. Fuses for fuse holders on line/load cable to pole wire connection shall be Type MEQ or MEM equal 12 ampere rating.

This work consists of a furnishing and installing:

- a quick disconnect breakaway fuse holder and fuse for the power cable to pole wire connection and
- a quick disconnect breakaway fuse holder and solid slug for the neutral conductor connection
- MEQ or MEM 12 ampere rated fuse

This work will not be paid separately, but shall be considered included in the contract unit price per EACH for "LIGHTING STANDARD, SODIUM VAPOR, ACORN, 100 WATT".



**FLOOD LIGHT, GROUND MOUNTED, 100 WATTS, METAL HALIDE**

**FLOOD LIGHT, GROUND MOUNTED, 175 WATTS, METAL HALIDE**

**Description:** This work shall consist of furnishing and installing metal halide floodlights. Lamp wattage shall be as indicated on drawings. This work shall be performed in accordance with Section 821 of the Standard Specifications with the provisions as follows:

**Materials:**

**Housing:** Die-cast brass body, lamp housing and socket enclosure.

**Swivel:** Provides horizontal rotation independent of the threaded mount. Swivel locked by J-20 stainless set screw. Die-cast brass with locking teeth and 1/2" solid brass NPT mount.

**Reflector:** Spun specular Alzak® aluminum.

**Lens Frame:** Integral die-cast brass lens ring and glare shield. Tempered clear soda lime glass with silicone gasket. Flush with lens frame to promote water runoff when positioned upward.

**Gasketing:** Silicone gaskets used throughout.

**Socket:** Porcelain medium base.

**Wiring:** No. 18 AWG rated 105°C.

**Ballast:** High power factor -20°F. starting, mounted on tray, 120 Volt standard.

**Ballast Box:** High temperature, compression molded featuring long-fiber fiberglass impregnated heavy wall construction. Wall separates ballast chamber from splice compartments, splice area 32 cu in.; prewired, two anti-siphon plugs to and from ballast chamber. Conduit entry; two 3/4" NPT for through wiring, one 1/2" NPT for remote access.

**Ballast Cover:** Cast bronze, supplied with 1/2" NPSM for direct mount, with stainless steel set screw lock.

**Finish:** Verde Green Patina.

**Certification:** UL Listed to U.S. and Canadian safety standards for wet locations.

**CONSTRUCTION REQUIREMENTS**

Prior to location of a concrete support and ballast box, the Engineer shall designate the final location, elevation. Excavation required for the construction may require removal of existing concrete or asphalt. The excavated area shall be compacted to the satisfaction of the Engineer.

**Basis of Payment:** This work will be paid for at the contract unit price each for FLOOD LIGHTS of the type and wattage specified, complete with lamps, fuse holder and fuses.

**LIGHTING CONTROLLER, SPECIAL**

**DESCRIPTION:**

- A. This item shall consist of furnishing and installing a CBD/Holiday lighting electrical control cabinet complete with wiring and photo control for separate control of Naperville Central Business District Shepherds Crook lighting, plug circuits for Holiday Lighting, and 30 foot DMY street lighting as specified herein and as directed by the Engineer.
- B. Unless otherwise indicated, the cabinet, including all components, shall be new.

**GENERAL:**

- A. The cabinet shall be a ground mount of minimum width of 30 inches x 48 inches in height x 17 3/4 inches minimum depth (IDOT Type III) and shall be fabricated from aluminum alloy of 0.125" inches in thickness. The surfaces shall have a smooth, natural aluminum finish. The cabinet must be interchangeable with existing CBD Holiday Lighting Controllers.
- B. The main door is of NEMA type construction with a cellular neoprene gasket, which is rain and dirt tight without louver slots in the lower portion of the door to exclude the entry of moisture, dirt, and insects. Hinges are 14-gauge stainless steel. Standard equipment includes a three point locking system, which secures the door at the top, bottom, and center. A Corbin lock with two keys is also furnished. The main door is equipped with a two-position doorstop, one stop at 90 degrees and the other at 120 degrees.

A nameplate with the legend "City of Naperville Street Lighting" shall be fabricated and mounted on the main door. Below the nameplate, a 2nd plate with the legend "Contact the Department of Public Works at 420-6187 to report problems".

- A. The cabinet shall be equipped with a vent in the underside of the top overhand above the door, which is designed to resist moisture, dirt, and insects.
- B. The equipment mounting panel shall be made of 1/4-inch minimum non-asbestos, inorganic, non-conducting material and shall be drilled and tapped for front mounting of the equipment. The panel shall be easily installed and removed from the front of the panel.
- C. The heating strip shall not be mounted on the equipment mounting panel; the heating strip shall be mounted to the equipment rails on the side of the cabinet.

**CONTROLLER OPERATION:**

- A. The Naperville CBD/Holiday Lighting Controller shall provide control and provide over circuit protection for the separate operation of three (3) separate contactors as follows:
  - 1. Contactor #1 – 60 amp contactor, ASCO, 2 phase 120/240v or 120/208v for Shepherds Crook Luminaire circuits with 4 field breakers, 30 amp.
  - 2. Contactor #2 – 100 amp contactor, ASCO, 2 phase 120/240v or 120/208v for holiday light plug circuits on Shepherds Crook lighting standard with 4 field GFI circuit breakers, 35 amp.

3. Contactor #3 – 60 amp contactor, ASCO, 2 phase 120/240v or 120/208v for CBD 30 foot 250 watt M.H. DMY circuits with 2 field breakers, 35 amp. Each contactor shall have separate automatic, manual, off controls

The Naperville CBD/Holiday Lighting Controller shall control and provide over-current protection for a total of ten (10) individual street/holiday lighting circuits divided between the three (3) contactors, unless otherwise specified. Each circuit is to be protected by the use of individual thermal-magnetic circuit breakers. Provisions shall be made for connection of up to #6 stranded copper conductors for the individual circuits.

- B. The street light controller shall be actuated by a remotely mounted photocell, which will operate through an auxiliary on-delay relays to pick up the controller's main mechanically held contactors. The operation of the photocell will insure that the street/holiday light circuits are energized during nighttime hours and de-energized during daytime hours.

#### CONTROLLER EQUIPMENT:

1. 225 ampere main breaker, 2 pole, 240 volt, JDB 2100
2. Surge Protector, Square D SP-11100
3. Contactors:
  - a) Contactor #1 – Shepherds Crook Contactor: 60 ampere contactor, 2 pole, single throw, electrically operated and mechanically held remote switch, 120 volt, ASCO 2P.
  - b) Contactor #2 – Holiday Light Plug Circuit Contactor: 100 ampere contactor, 2 pole, single throw, electrically operated and mechanically held remote switch, 120 volt, ASCO 2P, 100 amp, model number 920210031.
  - c) Contactor #3 – DMY Contactor: 60 ampere contactor, 2 pole, single throw, electrically operated and mechanically held remote switch, 120 volt, ASCO 2P.
4. Ten (10) 1 pole circuit breakers, 120 volt, "I-Line".  
Control breaker, 1 pole, as follows:
  - a) Four 30 amp, 120v for Shepherds Crook circuit, contactor #1
  - b) Four 35 amp, 120v for holiday light circuit, contactor #2
  - c) Two 25 amp, 120v for DMY circuit, contactor #3.
5. Ground bus bar, 1/4" x 1" x 12", color coded green labeled "ground".
6. Neutral bus bar, 1/4" X 1" X 12", color coded white, labeled "neutral"
7. Three (3) 15 ampere, HOA switch, 120 volt, Square D Manual Return KS43FBH13
8. Photocell terminal block
9. Three (3) Relay, DPDT, 120 v, on-delay, Magnacraft W211ACPSOX-7
10. 20 ampere duplex receptacle, GFCI
11. Incandescent light fixture of the enclosed and gasketed type, Crouse Hinds VXHF15GP
12. SPST 20 ampere switch
13. NEMA 4x enclosure
14. Heating Strip, 150 watt Grainger 2E919
15. Thermostat, Grainger 2E552

Secondary Pedestal, Naperville Public Utilities Department Electric Standards

**SERVICE TO LIGHTING CONTROLLER:**

- A. A Secondary Pedestal, Naperville Public Utilities Department Electric Standards, shall be installed a minimum of 5 feet from the NDPUE service point. The service wiring from the Naperville Electric Department shall be 3-1/C – No. 2 XLP/USE-2 colored insulation of black, red, white, and green in 2" GC(Galvanized Steel Conduit) or 2" Unit Duct as specified by the Engineer. Where the service is from an aerial circuit on a wood pole, the underground Unit Duct from the secondary pedestal shall terminate 2 feet above the ground in a coupling connecting the 2" GC/Unit Duct to a 2" Schedule 40 Unit Duct/PVC conduit on the pole to a height of a minimum of 10 feet.
- B. This work includes installation of Secondary Pedestal between the Naperville Electric source and the Lighting Controller.
- C. A metallic threaded bushing with a lug will be installed on the 2" Galvanized Steel Conduit (Service Conduit) and connected by a 1/C #6 green color insulated copper cable to the ground rod.
- D. The location of the Secondary Pedestal shall be a minimum of 5 feet, but not more than 10 feet from the Naperville Electric source. A minimum of 10 feet of 3-1/C No. 2 shall be provided at the Naperville Electric Department source for the purpose of making the connections to the source by Naperville Electric; this 10 feet of "tails" is included in ELECTRIC CABLE IN CONDUIT, 600V (XLP-TYPE USE) 3-1/C NO.2.

The Service to the Controller cabling is not included in the Unit Cost for the Controller unless otherwise specified in quantity for ELECTRIC CABLE IN CONDUIT, 600V (XLP-TYPE USE) 3-1/C NO.2.

**WIRING AND BUS BARS:**

All wiring and bus bars shall be of a size to handle the rated current of the connected equipment. Exposed bus bars shall be insulated, except for ground and neutral bus bars.

**GROUND AND NEUTRAL BUS BARS:**

Separate ground and neutral bus bars shall be provided. The ground bus bar shall be copper and mounted on the equipment panel. The neutral bar shall be similar. The heads of the screws shall be painted white for the neutral bar and green for the ground bar.

**WIRING AND IDENTIFICATION:**

- A. Wiring within the cabinet shall be of the size specified for the corresponding service conductors and branch circuits and shall be rated RHH/RHW or MTW, 600 volts.
- B. Control and auxiliary wiring shall be a minimum of #10 copper and rated RHH/RHW or MTW with jacket, 600 volt, stranded copper of appropriate colored insulation of red, black, white, and green.

- C. All power and control wiring shall be tagged with self-sticking cable markers and shall be stranded copper.
- D. All switches, controls and the like shall be identified as to function and position (as applicable) by means of engraved 2 color nameplates attached with screws.

**CIRCUIT BREAKERS:**

- A. All feeders, branch circuits, and auxiliary and control circuits shall have over current protection per the requirements of the NEC and as shown on the engineering plans. The over current protection shall be by means of circuit breakers.
- B. Circuit breakers shall be standard UL-listed molded case, thermal magnetic "I-Line" breakers with trip free indicating handles with terminals adequate for #6 single conductor copper cable.
- C. Circuit breakers shall have an UL-listed interrupting rating of not less than 10,000 rms symmetrical amperes at rated voltage.
- D. The ten (10) branch circuit breakers shall be as specified on the circuit schematic, unless a lesser number is specified.

**CONTACTOR(S):**

- A. The contactor shall be electrically operated, mechanically held, with the number of poles required for the service and with 120 volt operating coil voltage as indicated or otherwise required. Ampere rating of the contactors shall not be less than required for the duty as indicated. Unless otherwise indicated in the engineering plans, the contactor shall be an ASCO 2P.
- B. Contactor(s) shall be complete with a non-conducting inorganic, non-asbestos sub-panel for mounting.
- C. Contactor(s) shall be mechanically held, and shall be complete with coil-clearing contacts to interrupt current through the coil once the contactor is held in position.
- D. The main contactor contacts shall be double break, silver-to-silver type. They shall be spring-loaded and provide a wiping action when opening and closing. The contacts shall be renewable from the front panel, self-aligning, and protected by auxiliary arcing contacts.
- E. The line and load terminals shall be pressure type terminals of copper construction and of the proper size for the ampere rating of the contactor.
- F. The contactor operating coil shall be rated for nominal 120 volt, single phase.
- G. Protection from accidental contact with current carrying parts, when operating the contactor manually, shall be provided.

- H. Contactors shall be clearly marked to indicate whether they are in the open or closed position.

**AUTO/MANUAL CONTROL:**

- A. The cabinet shall be equipped with automatic and manual operating controls via three (3) separate one-pole, double-throw switch, one switch for each contactor. The switch shall be premium specification grade, rated for the applied duty, but not less than 20 amperes at 120 volts and shall be mounted in a 4-inch square box with cover.
- B. The cabinet control and auxiliary device circuit shall have over current protection as indicated and as required by NEC.
- C. Each street lighting controller shall be wired to an individual photocell located on top of the nearest street light pole. The photocell shall operate at 120 volts, 60 Hertz, AC, and be rated at 1,000 watts. The photocell shall be grounded to the luminaire. The photocell shall be wired to the street lighting controller in unit duct, 1 1/4" minimum size, 3/C - #10, 600V, XLP/USE-2 of colored insulation of red, black, and white, if the cabling to the photo-cell cannot be pulled into a field circuit conduit. The photocell, the photocell control wiring connecting the controller in the cabinet to the photocell, and the unit duct for the photo-cell wiring are separate pay items and are not included in the cost for LIGHTING CONTROLLER, SPECIAL.

**INTERIOR LIGHTING AND RECEPTACLE:**

- A. The auxiliary device circuit shall provide 120 volts single phase to supply the convenience receptacle and cabinet light.
- B. The cabinet shall be equipped with an interior, 60-watt incandescent lighting fixture of the enclosed and gasketed type switched from a single pole, single throw, 20 amperes switch. The switch shall be premium specification grade in a suitable 4-inch box with a cover.
- C. The cabinet shall be equipped with a 120-volt, 20-ampere G.F.I. duplex receptacle, premium specification grade in a 4-inch square box with a cover.
- D. The cabinet shall be equipped with a heating strip that shall maintain the temperature within the cabinet at a minimum of forty (40) degrees Fahrenheit.

**TESTING OF THE ASSEMBLED CABINET:**

Prior to shipment of the completed cabinet, the control cabinet shall be tested for load, short circuits and complete operation of the cabinet as specified herein and as shown on the plans.

**ACCEPTANCE AND CONNECTION:**

Upon final inspection and approval of the street light system, NDPU-E will provide all labor and material necessary to provide 120/240 volt, 2-phase, electrical service connection to the Secondary Pedestal.

This work will be paid for at the contract unit price per **EACH** for "**LIGHTING CONTROLLER, SPECIAL**".

### **RELOCATE EXISTING LIGHTING UNIT**

This work shall be performed in accordance with Section 844 of the Standard Specifications with the following provisions:

The existing Shepherds pole shall be removed, stored for reinstallation when needed. The concrete base removed and disposed in accordance with Section 842 of the Standard Specifications. Relocation of pole shall include new concrete base as included in relocation cost complete with new anchor bolts and accessories.

This work will be paid for at the contract unit price per **EACH** for **RELOCATE EXISTING LIGHTING UNIT** including pole wire, concrete foundation base, fuseholders and fuses.

### **REMOVE BRIDGE SERVICE, WOOD POLE, MESSENGER WIRES**

This work shall be performed in accordance with Section 841 of the Standard Specifications with the following provisions:

Removal shall include the removal of existing bridge service wood pole service to lighting, aerial cables and all associated apparatus, and connections. This removal shall include removal of all wires and connections to the associated lighting photocell control.

This work will be paid for at the contract unit price per **EACH** for **"REMOVE BRIDGE SERVICE, WOOD POLE, MESSENGER WIRES"**, and other appurtenant items attached thereto.

### **PHOTOCELL CONTROL WIRE**

This item shall consist of furnishing, installing, and connecting 3/C No. 10 AWG 600 volt insulated copper conductor, USE-2/XLP, stranded in conformance with ASTM B-8 from the photocell on the luminaire closest to the street lighting control cabinet through underground duct to the terminal connections in the street lighting control cabinet. Connection of pole wire to the terminals in the street lighting luminaire is incidental to the installation of the pole wire.

- A. Photocell control wire, 3/C - #10 shall be insulated with cross-linked polyethylene, (XLP) insulation jackets of black, red, and white colored insulation. The wire is to run inside the duct, the pole and the mast arm.

**SPlicing OF LIGHTING CABLES** shall be incidental to the installation of electrical cable in conduit.

This work will be paid for at the contract unit price per **FOOT** for **"ELECTRIC CABLE IN CONDUIT, 600V (USE-2/XLP) 3/C NO. 10"**.

**6-WAY PVC DUCT BANK, 6 X 6" DIA.**

**Description:** This work shall consist of installing PVC duct bank systems of the type and size specified herein and as noted in the Plans, including but not limited to clearing and grubbing, removing the street base, black dirt and sod, sidewalks, curb and gutter, removing all excavated materials off site, excavation of the trench, shoring and bracing materials as required per OSHA, line and grade, loading and transporting the PVC conduit from the City of Naperville storage locations, installing conduit bedding, installing the PVC conduit, base spacers, intermediate spacers, connection to the existing manholes or conduit, HDPE conduit or steel conduit with concrete encasement, de-watering of the trench, testing and protection. The trench shall be excavated to the neat lines, width and depth as shown on the plans or as directed by the Engineer.

**Materials:** Materials supplied by the City will include 6" PVC pipe, conduit, bends, steel bends, fittings, couplings, intermediate spacers, warning tape, pull rope or detectable Mule tape, summer cement (slow curing), marker balls and plugs. Materials shall be loaded, transported and deposited by the contractor from City storage areas to the site.

**Construction:** The 6" diameter heavy wall Schedule 40 PVC conduits (20 foot lengths) shall be installed in a prepared trench on a 2" level bed of fine aggregate meeting the gradation requirements of CA-6 to the lines and grades as shown on the Plans or as directed by the Engineer. The conduit shall be installed on base and intermediate spacers at 5' spacing, so that a 2" separation is maintained between the conduits. Additionally, conduits shall be placed so the joints are staggered where no couplings are in line with adjacent couplings.

During installation, conduit joints shall be cleaned with Stoddard solvent, methyl ethyl ketone, or acetone, liberally coated with solvent cement and promptly engaged with the previously installed conduit. The joint shall be turned 90 degrees to dispel air and evenly distribute the solvent cement over the contact surfaces being joined. Final assembly of the joint should not exceed 60 seconds. The Contractor shall open no more than a 50-foot headway to allow for smooth grade changes of the conduit system to miss obstructions.

Upon the completion of the conduit assembly, the duct bank neat line shall be encased the full width of the trench from the invert of the bottom conduit to four (4) inches above the crown of the top conduit with concrete as specified by cross sections on the plans or as directed by the Engineer. The excavation shall then be backfilled with spoil excavation, flowable fill concrete, controlled low-strength materials or trench backfill (CA-6) as shown in the Plans, stated herein, or as directed by the Engineer. During the backfilling of the duct bank system, a yellow warning tape shall be installed 1.0' above the crown of the top conduit, except within the river section. The warning tape shall be installed with the words "CAUTION, DANGER ELECTRIC" facing up. In areas where the proposed PVC duct bank is to be placed in the street, the backfilling operations shall extend from the top of the encasement to 3 inches below existing pavement grade. In areas where the duct bank is not to be placed in the street, the backfilling operations shall extend from the top of the encasement to the sub-grade elevation to allow for final restoration of the trench area.

Contractor shall note that for ducts that are to be concrete encased, they should first be encased and cured a sufficient amount of time prior to the backfilling with aggregate or other backfill material. If counterpoise is required, the counterpoise shall be installed in the conduit trench in the backfilled area.



The Contractor shall provide sufficient excavation, bracing, materials, concrete encasement, and backfill to transpose the 6-way duct bank from a 2 by 6 inch duct package on 8-inch centers to a 2 by 6 inch duct package on 15-inch centers to align with the PVC sleeves in the north abutment wall. The cost of the PVC sleeves is included in the pay item Concrete Structures for the north abutment. The Contractor shall provide all support, materials and labor to maintain the desired separations and transposition in a transition zone that is a least 30 feet long at this location. The Contractor shall be furnished with 5-degree plastic bends, couplings, 11, 22, 30, and 45 degree steel bends to accomplish this work. No spacers or straight steel pipe rigid galvanized with couplings are provided. The Contractor shall provide all 6 inch diameter straight rigid steel galvanized conduit with couplings. All layout and prefitting on the job site is included in the pricing as well as the shaping, cutting, shaving, threading rigid 6- inch steel pipes, couplings for steel pipes, leveling, bracing, provide the spacers and separators, alignment and positioning of the duct package while maintaining the trench dimensions.

**EXCAVATIONS MAY NOT BE LEFT UNATTENDED. ALL EXCAVATIONS SHALL BE EITHER BACKFILLED AT THE END OF EACH DAYS WORK, OR COVERED WITH STEEL PLATES AND SECURED OF SUFFICIENT STRENGTH AND QUANTITY TO PROVIDE ACCESS TO ALL ROADWAYS AND/OR DRIVEWAYS.**

The Contractor shall restore the excavation site to an elevation equal to that at the time of commencement of the project. Areas which will be paved shall receive a minimum of 6" compacted gravel. All areas of turf disturbed shall receive a minimum of 6" of topsoil and salt tolerant sod. Those areas shown in agriculture or parkway shall be restored to a depth that which existed prior to excavation. With City approval, the topsoil may be utilized from material the Contractor has stockpiled from this project or hauled on-site. Materials and methods for this item shall conform to the requirements of Section 211 and Article 1081.05 of the Standard Specifications. Surplus materials shall be disposed of at an approved legal site. The costs for topsoil and disposal of surplus materials shall be included in the cost of the PVC Ducts.

If water is encountered, pumps of sufficient capacity to handle the flow shall be maintained at the site and shall be constantly attended operation on a 24-hour basis until their operation can be safely halted. When dewatering, close observation shall be maintained to detect any settlement or displacement of the embankment or trench. Cost for dewatering shall be included in the cost of this item.

Prior to acceptance, the conduit shall be cleaned and tested by pulling a mandrel of appropriate size through the duct. Mandrel sizing shall be in accordance with Section 31-1.11 of the Standard Specifications for Water and Sewer Main Construction in Illinois. The Contractor shall leave the pull string in the duct. The testing and pulling of the mandrel shall be done in the presence of the Engineer. Any ducts found to be defective or blocked must be cleaned or repaired and re-tested to the satisfaction of the Engineer at the Contractor's expense prior to acceptance. Mandrel size shall be 5.67" in diameter for the 6" diameter SCH 40 PVC duct.

All PVC conduit used on the job shall conform to the following: DPU-E Code 285-100-00070 Six (6) inch Schedule 40 heavy wall PVC conduit, supplied in 20' lengths with one belled end. Conduit must comply with UL standards 651 and NEMA TC2-1990 and must be shown on each length of conduit. Carlon 49017, J-M Manufacturing Co. Inc. 40600, Cantex A52GA12, National 333706020 or DPU-E evaluated equivalent.

The Contractor is advised all initial line and grades by the City of Naperville are supplied once. Any and all returns are at the Contractor's cost.

Should the Contractor exceed the specified trench width, and the allowable volumes of encasement per lineal foot of duct bank are exceeded, the Contractor shall consider any additional material, labor or equipment included in the cost of the item. The City reserves the right to reject requests for over-excavation.

Method of Measurement: The installed PVC Duct Bank shall be measured for payment in place in feet per the neat lines shown on the drawings, along its center line from outside edge of manhole to outside edge of manhole, or to the PVC Duct Bank stub installed in casing or open trench.

Basis of Payment: This work shall be paid for at the contract unit price per lineal foot, for 6-Way PVC DUCT BANK, 6 X 6" DIA., which price shall be considered payment in full for completing this work as specified including the excavation of the trench materials, off-site material disposal, loading and transporting the PVC conduit from the City of Naperville storage locations, headway, installing conduit bedding, cutting, aligning, leveling, measuring, assembly and gluing fittings, connections and conduit, installing the PVC conduit, installing 6" steel bends, fittings and bell ends, top, bottom and intermediate spacers, installing transpositions and for all labor, tools, equipment and incidental items necessary to complete this work as specified. The conduit shall be 6" I.D. PVC Schedule 40 in 20' lengths, and will be supplied by the City of Naperville. See drawings for backfill material. Trench Backfill, CA-6, Concrete Encasement, Controlled Low-Strength Materials (CLSM), Counterpoise, Rod and Mandrel and Pulling Rope and Detectable Mule Tape shall be paid separately. Restoration in the road is included in the roadwork. The Electrical Contractor shall coordinate work so restoration is not required. If the Electrical Contractor needs to provide restoration, it shall be included in this price item. Restoration is based only on work required outside the road improvement area.

#### **TYPE 'G' MANHOLE INSTALLATION**

Description: The Contractor shall install all City furnished electrical manholes in a prepared excavation to the line and grades as shown on the drawings, or as directed by the Engineer. The Contractor shall be responsible for but not limited to preparing the excavation, security of site, grounding and testing, removing pavement and all surface materials, training detectable muletape thru manhole and attaching to frame of manhole, restoring surface materials, shoring, sheeting, dewatering, installing a 6" Coarse Aggregate Gradation CA-7 for bedding, modifying the manhole to accept existing and proposed conduits, making final conduit connection, installing the manhole to final grade, adjusting collar(s), installing the frame and cover, aligning, fitting and leveling to the line and grades as shown on the drawings or as directed by the Engineer.

In those locations where manholes are shown on the plan or directed by the Engineer to be placed in paved areas, CLSM shall be used as backfill around the manhole up to the sub-grade. The cost for the CLSM around and over excavated areas of the manhole shall be considered included in the cost of the manhole. In unpaved areas CA-6 shall be used as backfill around the manhole to the bottom of the black dirt.

The Contractor shall be responsible for scheduling the delivery time and location with the City's supplier, and all equipment and labor associated with unloading the pre-cast concrete manhole sections. The manholes will come in two (2) sections (top and bottom) with openings provided to accommodate the 6" diameter PVC conduit as shown in the Detail Drawings. The Contractor shall lift manhole sections with slings only. Lifting from pulling irons will not be allowed. The

Contractor shall verify all dimensions and condition of the manhole supplied. All discrepancies shall be reported to the Engineer prior to installation.

The Contractor shall be responsible for installing concrete adjusting collars and a cast iron frame and cover, which are to be supplied with each manhole. The City will supply the adjusting collars, cast iron frames and covers and butyl mastic. It shall be the responsibility of the Contractor to load and transport the cast iron frames and covers and adjusting collars to the site from the City of Naperville storage yard.

The Contractor shall install a complete grounding system and test grounds for each manhole installed and/or as shown on drawings. See drawing for dimensions and weights and grounding details.

Manholes may be buoyant without backfill and overburden. The Contractor shall adequately ballast the manhole to prevent uplifting prior to the backfilling of the excavation.

If water is encountered, pumps of sufficient capacity shall furnished and be maintained to handle the flow at the site and shall be in constantly attended operation on a 24-hour basis until their operation can be safely halted. When dewatering, close observation shall be maintained to detect any settlement or displacement of the embankment. Providing additional bracing, supporting and manpower to complete the job shall be considered included in the cost of the item.

Method of Measurement: Electrical manhole installation shall be counted each per electrical manhole installed.

Basis of Payment: This work shall be paid for at the contract unit price per each for TYPE 'G' MANHOLE INSTALLATION, which includes the installation of 1 to 4 adjusting rings as required plus frame and lid as indicated, which payment will be full compensation for all excavation, disposal of materials off-site, dewatering, installing complete with concrete tops, frames and covers, grounds and testing, adjusting rings, sumps with grates, grounding system, bedding, CLSM backfill, CA-6 backfill, fittings, materials, tools, labor, equipment and incidentals necessary to complete this work as specified for a complete job. Restoration consisting of 6" black dirt, grading and salt tolerant sod plus watering is included when the work area is outside the limits of the road improvement, otherwise no restoration is required.

## VIDEO TAPE

Description: The Contractor shall make a careful examination of the location, field traverse the entire route of the project, observe and note existing site conditions and nature of the proposed work, as well as the drawings and specifications, and all other Contract Documents in connection with the work and services to be performed under this Contract.

Furthermore, the Contractor shall make a thorough investigation of the potential interferences and difficulties that may be encountered such as, underground utilities, trees, fences, gardens, shrubs, out buildings, landscaping, but not limited to, road conditions or boulders and debris along fence lines for the proper and complete execution of all work specified herein and/or shown or called for on the drawings.

Lack of knowledge of existing conditions or foreseeable conditions that will create difficulties or encumbrances in the execution of the work shall not be acceptable as an excuse for any failure on the part of the Contractor to fulfill in every detail all of the requirements of the specification and/or drawings. Furthermore, a lack of knowledge will not be accepted as basis for any claim whatsoever for additional or extra compensation.

It will be assumed that the submission of the proposal is evidence that the Contractor has performed the above and that the Contractor has made allowance for all contingencies in the Unit Price Contract and Schedule of Prices.

The Contractor shall perform all labor and provide all materials to video tape the entire route with audio. The video shall be in color on VHS or DVD. The Contractor shall video the entire right-of-way and 40 feet on either side. The Contractor shall video all evergreens, trees and fences in their natural state and show length height and depth. The video shall pick up all land features, houses, driveways, curbs and gutters, fire hydrants, sidewalks, street markings, berms, etc. for a complete representation of what is within the work area as the Contractor walks the right-of-way. The Contractor shall provide all pictures with dates and times and direction and verbally document the locations. The Contractor shall provide a video and audio at the beginning of the project covering the entire project and a video when the project is completed.

The Contractor shall provide one unit, which is 2 videos to the City of Naperville, one before the work is started and one after the work is completed. All videos to be considered acceptable shall be legible, in color, clear and identified by date, time, location and direction.

Method of Measurement: This work shall be measured for payment per unit, which is 2 videos to the City of Naperville, one before the work is started and one after the work is completed.

Basis of Payment: This work will be paid for at the contract price of a unit for VIDEO TAPE, which shall include all labor, materials, equipment, transportation and incidentals required to perform the work.

### **CONCRETE ENCASEMENT**

Description: This work shall consist of furnishing and installing the Concrete Encasement of the PVC Duct Bank System of the size and type specified herein or as noted on the plans and shall include, but is not limited to, providing concrete as specified herein and placing and vibrating the concrete in the trench.

General: Concrete Encasement shall be used to fill under, between and over the duct bank system to the full width of the trench in locations specified on the plans or as directed by the Engineer. When placing the concrete, care shall be taken to completely encase the duct bank system with the concrete meeting the mix design requirements as specified herein. After being placed, the concrete shall be vibrated by mechanical equipment to eliminate voids and ensure complete encasement of the conduits. Care shall be taken when vibrating the concrete as to not damage the PVC conduit, or separate the joints or couplings. The Contractor shall anchor the duct to prohibit the ducts from floating when backfilling with concrete encasement.

The concrete shall be Class SI, as specified in Article 1020.04 of the Standard Specifications for Road and Bridge Construction. The concrete shall have a slump of three (3) inches  $\pm$  one (1)

inch with a minimum compressive strength of 3500 psi at 14 days and an air entrainment between 5% and 8% by volume. The contractor may submit a mix design utilizing pea gravel (CA-14) for the Engineers approval.

Method of Measurement: Concrete Encasement shall be measured for payment in cubic yards in place, to the full width specified as shown on the typical trench details from 2" below the invert of the bottom conduit to 4" above the crown of the top conduit less the area of the conduits. No additional compensation will be allowed the Contractor should the trench width be exceeded or the Contractor exceed the allowable volumes of encasement material. Material tickets shall be turned in on a daily basis.

Basis of Payment: This work will be paid for at the contract unit price per cubic yard for CONCRETE ENCASEMENT, measured in place to the neat lines, which shall be full compensation for all materials, labor, equipment and appurtenances necessary for a complete item.

### **TRENCH BACKFILL, CA-6**

Description: This work shall consist of backfilling and compacting the duct bank with a coarse aggregate material through all pavement areas at the locations shown on the plans.

Materials: The aggregate shall conform to the requirements of Article 1004.01 of the Standard Specifications and the following specific requirements:

- a. Description: - The coarse aggregate shall be gravel, crushed gravel, crushed stone, crushed concrete, crushed slag or crushed sandstone.
- b. Quality: - The coarse aggregate shall be Class C quality or better.
- c. Gradation: - The coarse aggregate gradation shall be used as follows:

For the trench backfill in pavement areas - Gradation CA-6

- i. Paved Areas: - As soon as the condition of the concrete will permit, the entire width of the trench shall be backfilled with moist coarse aggregate meeting the gradation specified. The aggregate shall be placed longitudinally along the duct. The Contractor shall establish that the compressive strength of the concrete is sufficient to bear the weight of workers and equipment prior to commencing the backfilling operation. Aggregate material shall be placed in 8-inch thick layers (loose measurement) and firmly compacted by ramming or tamping with tools approved by the Engineer in such a manner as not to disturb or damage the duct.

The backfill shall continue to be placed and compacted as specified to the top of subgrade for future or proposed surfaces and/or shall be brought to a level even with the existing pavement to act as a temporary surface until the permanent surface can be restored. Removal of any stone to provide proper sub-base elevation for temporary patches and permanent pavement will be included in this item. The backfill for trenches and excavation made in the subgrade of the existing or proposed improvement, and for all trenches outside of the subgrade where the inner edge of the trench is within 3 feet of

the edge of the existing or proposed pavement, curb, gutter, curb and gutter, or sidewalk, shall be made with trench backfill material, unless the excavated material meets the requirements of the course aggregate specified.

All backfill material up to a height of 12 inches above the conduit shall be carefully deposited in uniform layers not exceeding 8-inches thick (loose measure). The material in each layer shall be firmly compacted by ramming or tamping with tools approved by the Engineer in such a manner as not to disturb or damage the duct. The backfilling and compaction above this height shall be done by Method 1, as specified in Article 542.04 of the Standard Specifications.

At the end of the settling and drying period, the crusted top of the backfill material shall be scarified and, if necessary, sufficient backfill material added, as specified in Method 1, to complete the backfilling operations.

The method used for backfilling and compacting the backfill material shall produce 95% compaction (modified proctor). Should the contractor's methods not produce these results, the Contractor will be required to alter or change the method being used so that the resultant backfill will be satisfactory to the Engineer. Should the Contractor be required to alter or change the method being used, no additional compensation will be allowed.

When sheeting and bracing have been used, sufficient bracing shall be left across the trench as the backfilling progresses to hold the sides firmly in place without caving or settlement. This bracing shall be removed as soon as practicable. Any depressions that may develop within the area involved in the construction operation due to settlement of the backfilling material shall be filled in a manner meeting the approval of the Engineer.

When the Contractor constructs the trench with sloped sides or benches, backfilling for the full width of the excavation shall be as herein before specified, except no additional compensation will be allowed for trench backfill material required outside the limits of the specified trench width.

- ii. Non-Paved Areas: When ducts are constructed outside the limits of the pavement, as described in Part A, aggregate backfill will not be required above the top of duct. The Contractor may use the originally excavated materials. Compaction of the excavated materials shall be by Method 1 as outlined in Article 542.04 of the Standard Specifications. Aggregate backfill will still be required to fill any voids under and/or adjacent to the top of duct.

Method of Measurement: Trench backfill shall be furnished for backfilling to the full width of the trench in areas requiring aggregate backfill only. It will be measured in cubic yards in place, except that the quantity for which payment will be made shall not exceed the volume of the trench as computed by using the actual depth of the trench to the top of the concrete duct, the actual length as measured along the center of the concrete duct and by using a maximum trench width. Any trench backfill required in excess of the maximum quantity herein specified shall be furnished at the Contractor's own expense. Actual trench excavation may vary due to depth, soil conditions and to meet OSHA and all other State, Federal and Local safety requirements. No additional compensation shall be made for this item, and such work shall be considered included in the pay item.

Trench backfill shall be measured for payment in place to the full width specified from the crown top of concrete to within 4" of final grade, to allow for sodding and 4" of black dirt as shown on the details. No compensation will be allowed for trench backfill required below the top of the concrete duct or for originally excavated material used to backfill in Non-Paved Areas. Material tickets shall be turned in on a daily basis.

Basis of Payment: This work shall be paid for at the contract unit price per cubic yard, for TRENCH BACKFILL, measured in place to the neat lines, which shall include payment for furnishing the coarse aggregate, excavation, backfilling and compacting, and incidental materials and collateral work to complete the work as specified.

### **CONTROLLED LOW - STRENGTH MATERIALS (CLSM)**

Description: This work shall consist of furnishing, transporting, and placing CLSM, which can subsequently be excavated with conventional digging equipment.

Materials: Materials shall be according to the following Articles of Section 1000 - Materials of the Standard Specifications.

<u>Item</u>	<u>Article/Section</u>
(a.) Portland cement, Type I	1001
(b.) Water	1002
(c.) Fine Aggregate - FA-1 or -2 Sand (Note 1)	1003.01 (a), 1003.01 (c), 1003.04 (b)
(d) Fly Ash	1010.02, 1010.03
(e) Admixtures (Note 2)	1021.01

Note 1: Blending fine aggregate materials will not be permitted.

Note 2: The admixture may be in powder form. Prior to approval, a CLSM air-entraining admixture shall be evaluated in a field or laboratory experimental pour. The engineer will verify the experiment.

Equipment shall be according to the following Articles of Section 1100 - Equipment of the Standard Specifications

<u>Item</u>	<u>Article/Section</u>
(a.) Concrete Mixers	1103.01
(b.) Batching and Weighing Equipment	1103.02, 1103.03
(c.) Mobile Portland Cement Concrete Plants	1103.04
(d.) Water Supply Equipment	1103.11

Portioning: The mix shall be Mix 1, 2, or 3 and yield approximately one cubic meter (cubic yard).

Portland Cement	30 kg (50 lbs.)
Fly Ash - Class C or F	74 kg (125 lbs.)
Fine Aggregate - Saturated Surface Dry	1720 kg (2900 lbs.)
Water	248-322 L (50-65 gallons)
Air Content	No air-entrained

Portland Cement	74 kg (125 lbs.)
Fine Aggregate - Saturated Surface Dry	1483 kg (2500 lbs.)
Water	173-248 L (35-50 gallons)
Air Content	15-25%

Portland Cement	24 kg (40 lbs.)
Fly Ash - Class C or F	74 kg (125 lbs.)
Fine Aggregate - Saturated Surface Dry	1483 kg (2500 lbs.)
Water	173-248 L (35-50 gallons)
Air Content	15-25%

A Contractor may submit their own mix design and may propose alternate fine aggregate materials, fine aggregate gradations, or material proportions. The mix design shall meet the following minimum criteria.

Minimum Mix Design Criteria:

Flow	$\geq 178$ mm (7 inch)
Air Content	0 - 25%
Dynamic Cone Penetrometer (DCP) at 3 days	$\leq 39$ mm/blow (1.5" blow)
Compressive Strength (28 days and 180 days)	207 kPa (30 psi) to <1034 kPa (150 psi)

The mix design shall include the following information:

- (1.) Sources of all ingredient materials
- (2.) Gradation of fine aggregate
- (3.) Absolute volumes, specified gravities, unit weights, and any other values used in the mix design process
- (4.) Type and proposed dosage of admixtures
- (5.) Target flow and air content
- (6.) Test data indicating compressive strength at 28 and 180 days

If the Contractor submits a mix design that has not been previously verified by the Engineer, a trial batch will be required. The trial batch shall be scheduled at least 30 calendar days prior to anticipated use, and shall be performed in the presence of the Engineer. A minimum 0.75 cubic meters (1 cubic yard) trial batch shall be produced and placed off-site. The trial batch shall be produced with the equipment and methods intended for construction. The Engineer will evaluate the trial batch for temperature, flow, air content, DCP and 28-day compressive strength.

Verification of the mix design will include the trial batch test results, field observations (i.e. flowability and solid suspension), and other criteria as determined by the Engineer. The Contractor will be notified in writing of verification. Verification of a mix design by the Engineer shall in no manner be construed as acceptance of any CLSM produced.

Sampling the freshly mixed flowable fill shall be performed according to Illinois Modified AASHTO T 141, except the elapsed time for obtaining the composite sample shall not exceed 2 minutes. The flow test shall start within 5 minutes of obtaining the composite sample. The molding of strength test specimens shall start within 10 minutes of obtaining the composite sample.



The temperature test shall be according to Illinois Modified ASTM C 1064.

The flow test shall consist of filling a 76 mm (3 inch) inside diameter by 152 mm (6 inch) long plastic cylinder. The maximum variation from the nominal inside diameter and length shall be 3 mm (1/8 inch). The plastic cylinder shall be smooth, rigid, and open at both ends. The test procedure shall consist of placing the cylinder on a flat, level, firm surface that is free of vibration or other disturbances. The cylinder shall be firmly held in place and filled in one lift. The top of the cylinder shall be struck off to form a level surface while holding the cylinder in place. The cylinder shall be pulled straight up, and the approximate diameter of the mixture's spread shall be measured.

The air content test shall be according to Illinois Modified AASHTO T 121 or Illinois Modified AASHTO T 152, except the bowl shall be filled in one lift without vibration, rodding, or tapping.

The DCP test shall be according to the Illinois Department of Transportation test method.

The compressive strength test shall be according to Illinois Modified AASHTO T 22, except neoprene caps shall be used for compressive testing. Strength is defined as the average of two or more cylinder breaks. The 152 mm x 305 mm (6 inch x 12 inch) cylinders shall be made according to Illinois modified AASHTO T 23, except the cylinders shall be filled in one lift without vibration, rodding, or tapping. When bleed water appears at the top of the mold after a few minutes, the mold shall be refilled. The curing method shall be modified by not removing the covered specimen from the mold until the time of testing. The cylinders shall be stored in a shaded area with a controlled temperature of 16 °C to 27 °C (60 °F to 80 °F).

The mix shall be produced according to Section 1020 of the Standard Specifications. Sufficient mixing capacity shall be provided to permit the placement without interruption. The mixer drum shall be emptied prior to the initial batch to ensure that no additional cement fines are incorporated into the mix.

The Engineer reserves the right to adjust the proportion of materials in the field for flowability, to maintain solid suspension of the mix, and other criteria. No additional compensation will be paid to the Contractor for a mix adjustment.

Construction: The mix shall not be placed on frozen ground, in standing water, or during wet weather conditions. Mixing and placing shall begin only if the air temperature is 2 °C (35 °F) minimum and rising. At time of placement, the material temperature shall be 5 °C (40 °F) minimum. Mixing and placing shall stop when the air temperature is 5 °C (40 °F) and falling.

The mix shall be placed directly from the chute into the space to be filled. The Engineer may approve other placement methods if the mix design is appropriate.

When backfilling against structures, the mix shall be placed in layers to prevent damage by lateral pressures. Side slopes shall be stepped or serrated to prevent wedging action of the backfill against the structure. Each layer shall be allowed to harden prior to placing the next layer.

When backfilling pipe culverts and electrical ducts, the mix shall be distributed evenly on each side of the pipe culvert or conduit to prevent movement. To prevent uplift of the pipe culvert, the first layer shall stop at one-fourth the height of the culvert. After settlement of the first layer, as determined by the Engineer, the second layer shall stop at one-half the height of the culvert.

After settlement of the second layer, as determined by the Engineer, the remainder of the trench shall be filled. A mix may be placed in a single layer for Portland cement concrete pipe culverts.

The mix shall not be exposed to freezing temperatures or wet weather conditions during the first 24 hours after placement.

The mix may be subjected to loading upon approval by the Engineer, or when a penetration of 39 mm/blow or less has been obtained with the DCP test.

Method of Measurement: CLSM shall be measured for payment in cubic yards in place to the full width specified as shown on the details from crown of the top conduit to the sub-base of the proposed finished surface. Material tickets shall be turned in on a daily basis. Measurement for CLSM around manholes will not be measured separately, but shall be considered included in the unit price of the manhole.

Basis of Payment: This work will be paid for at the contract unit price per cubic yard for CONTROLLED LOW-STRENGTH MATERIALS (CLSM), measured in place to the neat lines, which shall include all equipment, labor and incidentals required to perform the work as specified.

## **ROD AND MANDREL**

Description: The Contractor shall rod, mandrel and lubricate all ducts installed. The Contractor shall furnish a 12-inch long by 5-3/4 inch diameter mandrel for 6-inch conduit, made of wood or steel, with a pulling eye on each end. The mandrel shall be submitted for approval by the City of Naperville. The Contractor shall use this mandrel to mandrel the ducts. The Company shall observe the mandrel installation. A nylon pulling line 1/8th inch in diameter or detectable mule tape shall be furnished by the City of Naperville, and shall be pulled through the ducts and left secured to the top of the vault or structure. A 12-inch long tail shall extend outside the enclosure to allow the locator to put a tone on the detectable mule tape. The conduit ends shall be sealed, capped and plugged on both ends, and a tail left through the sealed ends of the conduit for others to pull cable at a later date. The drawings shall be marked and noted that all ducts have been mandreled and signed by both the City of Naperville and the Contractor to verify all ducts are clear and sealed for future use.

Any ducts found unclear within one year after installation will be dug up by the Contractor and cleared at no cost to the City of Naperville. However, if the blockage can be determined by the Contractor by excavating in the questioned area where the conduit is blocked, and it is determined that the blockage was definitely caused by some unknown party, then the cost of repairing the conduit and excavating shall be borne by the City of Naperville. But, if after excavating, it is not a clear or there is some doubt that the blockage was not caused by another party, then the Contractor shall repair the conduit, close up the excavation and landscape at the Contractor's own expense. The City of Naperville shall make the final decision.

Availability of an outage to perform this work is determined by the conditions of the City of Naperville's electrical system and may not be available in the time frame that will meet the Contractor's needs. This condition is normal and is considered incidental to the work. A 72-hour notice is required for each and every work location. Any delay in completing the work due to outage restrictions or lack of an outage is not a reason for additional compensation and will not be considered.

**Method of Measurement:** This work shall be measured for payment in place in feet per the neat lines shown on the drawings, along its center line from outside edge of manhole to outside edge of manhole, or to the PVC Duct Bank stub installed in casing or open trench.

**Basis of Payment:** This work shall be paid for at the contract unit price per foot for ROD AND MANDREL, which price shall include all equipment, labor and incidentals required to perform the work as specified.

### **GROUND ROD SYSTEM INSTALLATION**

**Description:** The Contractor shall install a ground rod system at each new installation, one 10-foot ground rod at each transformer vault, four 10-foot ground rods (in 5-foot lengths) at each fuse, plug or switchgear vault, handhole, splice box, and manhole, and one 10-foot ground rod at each riser pole. The Contractor shall install 50-feet of #4 stranded copper ground wire around the inside perimeter of each vault, handhole and splice box, with connections and anchors per specification.

The Contractor shall test all ground rods installed and the total system of rods and wire. Grounding shall meet or exceed the applicable portions of the National Electrical Code and Section 800 - Electrical of the Standard Specifications. The Contractor shall record data on forms supplied by the City and provide to the Engineer for approval. The Contractor is advised that the cost of testing is included in the pricing for vaults, handholes, splice boxes, manholes and riser installations for a complete job.

Availability of an outage to perform this work is determined by the conditions of the City of Naperville's electrical system and may not be available in the time frame that will meet the Contractor's needs. This condition is normal and is considered incidental to the work. A 72-hour notice is required for each and every work location. Any delay in completing the work due to outage restrictions or lack of an outage is not a reason for additional compensation and will not be considered.

**Method of Measurement:** Ground rod system installation shall be counted as each per ground rod system installed as described per this specification.

**Basis of Payment:** This work shall be paid for at the contract unit price per each for GROUND ROD SYSTEM INSTALLATION, which price shall be considered payment in full for completing this work.

### **PULLING ROPE AND DETECTABLE MULE TAPE**

**Description:** The Contractor is required to install all conduit ends with seals and plugs as permanent, and provide additional protection if the Contractor deems it necessary to last for a 5 year service life. This work includes installing the nylon pulling rope or detectable mule tape through the sealing mechanism by providing a hole large enough to pass the rope or tape through. The nylon rope or detectable mule tape shall be secured to prevent accidental rope removal by others. The Contractor shall extend the rope or tape to the outside of the equipment and secure by bolting to the equipment leaving a 12-inch tail. The Contractor shall install the

rope or tape as soon as the pipe has been installed so that the detectable tape can be located by JULIE.

No additional compensation shall be paid if the ducts are not sealed and later are found blocked. The Contractor shall bare the cost of all work to repair the ducts. The Contractor is advised to photograph each duct sealed, indicate the strength of the seal, document the date of installation, identify the location, and provide the photographs to the City of Naperville. If the Contractor does not document the conduit seal, the Contractor shall bare the cost of repair for any and all reasons. Others shall remove seals and rope when the new transformers and cables are installed. The Contractor shall prepare a drawing showing which conduits have pulling rope or detectable tape in them as they are installed and provided to the City of Naperville. Failure to install the rope or tape promptly is a reason to reject the pipe installation.

Availability of an outage to perform this work is determined by the conditions of the City of Naperville's electrical system and may not be available in the time frame that will meet the Contractor's needs. This condition is normal and is considered incidental to the work. A 72-hour notice is required for each and every work location. Any delay in completing the work due to outage restrictions or lack of an outage is not a reason for additional compensation and will not be considered.

Materials: Materials supplied by the City include pull rope or detectable mule tape and plugs as indicated in the special provision for 1 X 6" DIA. PVC pipe. Materials shall be loaded, transported and deposited by the contractor from City storage areas to the site.

Method of Measurement: This work shall be measured for payment in place in feet per the neat lines shown on the drawings, along its center line from outside edge of manhole to outside edge of manhole, or to the PVC Duct Bank stub installed in casing or open trench.

Basis of Payment: This work shall be paid for at the contract unit price per foot for PULLING ROPE AND DETECTABLE MULE TAPE, which price shall be considered payment in full for completing this work.

### **COUNTERPOISE, PAVED**

Description: The Contractor shall install counterpoise at or in a manhole, trench, handhole or vault as directed by the Engineer or as shown on the drawings.

General: The counterpoise shall be installed at the locations in paved and unpaved areas as directed by the Engineer. The work consists of traffic control, excavating, backfilling, protecting the work area, restoring pavement to the original condition or better, disposal of all excavated materials off-site, picking up and delivering all material from the City of Naperville storage facilities to the job site and installing the equipment.

The Contractor shall excavate a trench 18 to 24 inches deep and 6 inches wide for a minimum of 10 feet in a radial direction out from the equipment. A bare #4/0 stranded coated copper conductor shall be installed into the trench, backfilled with CA-6, compacted in 6-inch lifts and connected 18 inches below ground to the ground rods previously installed.

The disturbed area in unpaved areas shall be fully restored with 4 inches of black dirt and sod. The disturbed area in paved areas shall be restored with 12 inches of BAM and 2 inches of

asphalt or 9-inch thick concrete with 6-inch sub-base of CA-6 in both. All grounding materials are supplied by the City of Naperville

The ground with the counterpoise connected and backfilled shall be tested and the resistance measured by the Fall of Potential Method Or Clamp on Method. A measured resistance of 25 ohms is the acceptable value. If the reading is above 25 ohms the Contractor shall contact the Engineer and another counterpoise may be installed, tested and results evaluated.

The Contractor shall perform test of the ground rods in the manhole prior to trenching of conduit. In the event an acceptable ground measurement with rods cannot be attained at the manhole, the counterpoise shall be installed with the trench in the backfill area for a length designated by the Engineer.

Method of Measurement: This work shall be measured for payment in place in feet of counterpoise.

Basis of Payment: This work shall be paid for at the contract unit price per foot of COUNTERPOISE, of the type specified in place, which shall include all trenching, placing, supporting, traffic control, restoration of pavement and/or sod and installation of materials furnished by the City of Naperville and final restoration.

**HAND DIGGING, 0 FT TO 5 FEET IN PAVEMENT**

**HAND DIGGING, 5 FT TO 20 FEET IN PAVEMENT**

**HAND DIGGING, 0 FT TO 5 FEET IN UNPAVED AREAS**

**HAND DIGGING, 5 FT TO 20 FEET IN UNPAVED AREAS**

Description: The Contractor shall assemble the necessary equipment, traffic control, materials, customer contacts, and labor to perform an earth excavation to the length and width and to a 5-foot or 20-foot depth, and meet all federal, state and local regulations for hand digging as directed by the Engineer.

This work shall include saw cutting, excavating, steel plates, traffic control, removal and disposal of excavated materials off-site, pavement removal and installation, landscaping removal and installation, JULIE locates supporting foreign utilities, line and grade maintaining elevation, and all labor, tools, equipment, materials, permits, and appurtenances to complete this item to the satisfaction of the Engineer. The disturbed area in unpaved areas shall be fully restored with 4 inches of black dirt and sod. The disturbed area in paved areas shall be restored with 12 inches of BAM and 2 inches of asphalt or 9-inch thick concrete with 6-inch sub-base of CA-6 in both.

Availability of an outage to perform this work is determined by the conditions of the City of Naperville's electrical system and may not be available in the time frame that will meet the Contractor's needs. This condition is normal and is considered incidental to the work. A 72-hour notice is required for each and every work location. Any delay in completing the work due to outage restrictions or lack of an outage is not a reason for additional compensation and will not be considered.

Method of measurement: This work shall be measured for payment in place in cubic yards of hand digging excavation and calculated in feet (Length times Width times Depth in cubic yard volume) by the field measurement of neat lines. Material tickets shall be turned in on a daily basis.

Basis of payment: This work shall be paid for at the contract unit price of cubic yard for HAND DIGGING of the various types and locations shown on the plans, which shall include all required PCC concrete, saw cutting, expansion joints, forms, landscaping, material removal and disposal off-site, traffic control, protection work, materials falling into excavation shall be removed and replaced but not included in measurement, backfill materials placed and compacted in 6-inch lifts, bituminous materials and/or concrete removed and re-installed, tack coat, compaction and placement of sub-base backfill CA-6 materials, all temporary work, steel plates, and subgrade preparation with all materials, labor, equipment and appurtenances required for a complete item.

**MACHINE AIDED DIGGING, 0 FT TO 5 FEET IN PAVEMENT**

**MACHINE AIDED DIGGING, 5 FT TO 20 FEET IN PAVEMENT**

**MACHINE AIDED DIGGING, 0 FT TO 5 FEET IN UNPAVED AREAS**

**MACHINE AIDED DIGGING, 5 FT TO 20 FEET IN UNPAVED AREAS**

Description: The Contractor shall assemble the necessary equipment, traffic control, materials, customer contacts, and labor to perform an earth excavation to the length and width and to a 5-foot or 20-foot depth, and meet all federal, state and local regulations for machine aided digging as directed by the Engineer.

This work shall include saw cutting, excavating, steel plates, traffic control, removal and disposal of excavated materials off-site, pavement removal and installation, landscaping removal and installation, JULIE locates supporting foreign utilities, line and grade maintaining elevation, and all labor, tools, equipment, materials, permits, and appurtenances to complete this item to the satisfaction of the Engineer. The disturbed area in unpaved areas shall be fully restored with 4 inches of black dirt and sod. The disturbed area in paved areas shall be restored with 12 inches of BAM and 2 inches of asphalt or 9-inch thick concrete with 6-inch sub-base of CA-6 in both.

Availability of an outage to perform this work is determined by the conditions of the City of Naperville's electrical system and may not be available in the time frame that will meet the Contractor's needs. This condition is normal and is considered incidental to the work. A 72-hour notice is required for each and every work location. Any delay in completing the work due to outage restrictions or lack of an outage is not a reason for additional compensation and will not be considered.

Method of measurement: This work shall be measured for payment in place in cubic yards of machine aided digging excavation and calculated in feet (Length times Width times Depth in cubic yard volume) by the field measurement of neat lines. Material tickets shall be turned in on a daily basis.

Basis of payment: This work shall be paid for at the contract unit price of cubic yard for MACHINE AIDED DIGGING of the various types and locations shown on the plans, which shall include all required PCC concrete, saw cutting, expansion joints, forms, landscaping, material

removal and disposal off-site, traffic control, protection work, materials falling into excavation shall be removed and replaced but not included in measurement, backfill materials placed and compacted in 6-inch lifts, bituminous materials and/or concrete removed and re-installed, tack coat, compaction and placement of sub-base backfill CA-6 materials, all temporary work, steel plates, and subgrade preparation with all materials, labor, equipment and appurtenances required for a complete item.

### **ADJUSTING MANHOLE, FRAME, COVER AND RINGS**

Description: The Contractor shall remove and install any combination of 12, 6 or 3-inch rings, plus adjusting and leveling with whole bricks, (NO Holes) to lower, raise and adjust the manhole frame and cover to final grade. The manhole opening is 38 inches in diameter. The Contractor shall saw cut the pavement into a 5-foot square around the manhole neck. The Contractor shall remove every piece of manhole neck, dirt, street base and collars to the top of the manhole roof. The Contractor shall remove all debris existing in the manhole or which fall into the manhole during the work.

The Contractor shall install new neck rings to final grade which is usually 2'-6" to 4'-6" above the top of the manhole. All rings, frame and cover are supplied by the City of Naperville. The Contractor shall supply all other items, including, but not limited to, mortar, bricks, sand, concrete, asphalt, expansion joints, and CA-6 backfill. Materials shall be loaded, transported and deposited by the contractor from City storage areas to the site.

Method of measurement: Adjusting manhole, frame, cover and rings shall be counted each per electrical manhole adjusted.

Basis of payment: This work shall be paid for at the contract unit price per each for ADJUSTING MANHOLE, FRAME, COVER AND RINGS, for the installation of 1 to 4 adjusting rings as required, which payment will be full compensation for all excavation, disposal of materials off-site, dewatering, mortar, bricks, sand, concrete, asphalt, expansion joints, CA-6 backfill, materials, tools, labor, equipment and incidentals necessary to complete this work as specified for a complete job.

### **CONNECTING TO EXISTING MANHOLES BY CORE DRILLING**

Description: This item of work shall consist of furnishing all materials, tools, equipment and labor required to complete the installation of conduit to an existing or new electric manhole as detailed on the Plans and described herein.

General: The Contractor shall install one to six 6-inch steel galvanized rigid conduit attached to one to six 6-inch schedule 40 PVC conduit, using prefabricated 6-inch steel bends for entry into an existing reinforced concrete manhole by core drilling 6-inch diameter holes. The manhole is considered a confined space and has existing 12Kv cables installed, which shall remain energized. The Contractor shall perform all work, providing and installing protection per N.E.S.C and O.S.H.A regulations.

The typical manhole is 10 feet deep, 6 feet wide and 12 feet long with a single 2-foot long neck for entry. The manhole is of a precast concrete design meeting HS-20 loading at 2 feet of cover. The manholes are not furnished with ladders or a sump. The cables in the manhole shall be protected from falling debris. This work requires hand digging around energized 7200 volt phase to ground (12,470 volt phase to phase) primary cables, 600 volt secondary cables and 600 volt service and street light cables and various other utilities. If the manholes are filled with water, they will need to be pumped out and cleaned to a broom finish. Cost for dewatering shall be included in the cost of this item.

This work includes the installation of sufficient number of various degree steel bends with pieces of 6-inch PVC conduit, couplings, arranging, cutting, positioning, fusing and plugging ducts to extend by core drilling through the existing 8-inch thick reinforced concrete wall. This work includes digging a 6-foot wide by 6-foot long by 6-foot deep opening to provide access to allow equipment to core drill. The conduits and bends entering the structures shall be installed with steel bends into the structures, through the foundation at a distance of 6 inches above the top of the conduit package. All conduit openings shall be plugged and taped. The hole edges on the inside of the manhole shall be mudded in with concrete, sealed and made smooth and even with manhole wall. All debris shall be pumped or shoveled out of the manhole and disposed of off-site.

All openings into the existing manhole locations must be approved by the City of Naperville before any work is started. Core locations may be adjusted to meet the concerns of the City of Naperville. All manhole locations shall be identified in the field, dimensioned and recorded in the surveyor's field book records after the job is awarded to the Contractor.

Upon the completion of the manhole connection, the duct bank neat line shall be encased the full width of the trench from the invert of the bottom conduit to four (4) inches above the crown of the top conduit with concrete as specified by cross sections on the plans or as directed by the Engineer. The excavation shall then be backfilled with spoil excavation, flowable fill concrete, controlled low-strength materials or trench backfill (CA-6) as shown in the Plans, stated herein, or as directed by the Engineer. During the backfilling of the duct bank system, a yellow warning tape shall be installed 1.0' above the crown of the top conduit. The warning tape shall be installed with the words "CAUTION, DANGER ELECTRIC" facing up. In areas where the proposed PVC duct bank is to be placed in the street, the backfilling operations shall extend from the top of the encasement to 3 inches below existing pavement grade. In areas where the duct bank is not to be placed in the street, the backfilling operations shall extend from the top of the encasement to the sub-grade elevation to allow for final restoration of the trench area.

Contractor shall note that for ducts that are to be concrete encased, they should first be encased and cured a sufficient amount of time prior to the backfilling with aggregate or other backfill material.

This work includes: installing all conduits, cutting, placing and arranging conduits, steel bends, pumping, tunneling, cutting holes in manholes, leveling, and associated work to install conduit within and into the electrical equipment at the existing locations.

An outage to perform this work is determined by the conditions of the City of Naperville's electrical system and may not be available in the time frame that will meet the Contractor's needs. This condition is normal and is considered incidental to the work. A 72-hour notice is required for each and every work location. Any delay in completing the work due to outage restrictions or lack of an outage is not a reason for additional compensation and will not be



considered. In the event the Contractor can arrange for an outage the Contractor shall work as if the cables are energized.

Method of measurement: Connecting to existing manholes by core drilling shall be counted each per conduit connected to an existing electrical manhole.

Basis of payment: This work shall be paid for at the contract unit price per each for CONNECTING TO EXISTING MANHOLES BY CORE DRILLING, which price shall be considered payment in full for completing this work as specified, including the excavation of trench materials, off-site material disposal, pumping, tunneling, cutting holes in manholes, installing conduit bedding, cutting, aligning, leveling, measuring, assembly and gluing fittings, connections and conduit, installing the PVC conduit, installing 6" steel bends, fittings and bell ends, top, bottom and intermediate spacers, installing transpositions and for all labor, tools, equipment and incidental items necessary to complete this work as specified. Trench Backfill, CA-6, Concrete Encasement, FA-2 Encasement, Controlled Low-Strength Materials (CLSM), Rod and Mandrel and Pulling Rope and Detectable Mule Tape shall be paid separately. Restoration in the road is included in the roadwork. The Electrical Contractor shall coordinate work so restoration is not required. If the Electrical Contractor needs to provide restoration, it shall be included in this price item. Restoration is based only on work required outside the road improvement area.

**ELECTRIC DUCT BANK MATERIALS SUPPLIED BY THE CITY OF NAPERVILLE**

Item Description	Part #	HTE Code	Quantity	Unit
GROUNDING, #2 SOLID BARE COPPER	280-107-00020			FEET
GROUNDING, #4 STRANDED BARE COPPER	280-107-00050			FEET
GROUNDING, 4/0 STRANDED BARE COPPER	280-107-00070			FEET
CLAMP, GROUND ROD, 5/8"	283-156-00020		4	EACH
GROUND ROD COPPER CLAD, 5/8" x 5"	283-156-00030		4	EACH
COUPLING, BRONZE ROD	283-156-00040		4	EACH
FRAME/LID, MANHOLE, STEEL, TYPE "B"	284-103-00050	DEML	1	EACH
RING, MANHOLE ADJUSTING, 12" CONCRETE	284-103-00100	DEMR12	1	EACH
MANHOLE, TYPE "G"	284-103-00170	DEMG	1	EACH
MARKER, POWER BALL, RED	284-199-00250		3	EACH
TAPE CAUTION CABLE, 10 FOOT	284-199-00270	D0T	5.41	EACH
SIGN, NOTICE/OBSTRUCTION, 8" x 5"	284-199-00310		2	EACH
LAG SHIELD, LEAD SHORT	284-199-00460		28	EACH
LAG SCREWS SS	284-199-00470		28	EACH
CONDUIT 6 INCH DIA SCHEDULE 40 PVC (PIPE)	285-100-00070	D6C	2,160	FEET
ELBOW 6 INCH STEEL 48 INCH RADIUS, 22.5°	285-101-00180	D6B22.5S	36	EACH
ELBOW 6 INCH STEEL 48 INCH RADIUS, 30°	285-101-00190	D6B30S		EACH
ELBOW 6 INCH STEEL 48 INCH RADIUS, 45°	285-101-00200	D6B45S	24	EACH
COUPLING SLEEVE 6 INCH PVC, LONG LINE	285-102-00130		24	EACH
COUPLING 6 INCH LONG LINE SCH. 40 PVC	285-102-00140		24	EACH
COUPLING 6 INCH SCHEDULE 40 PVC 5°	285-102-00150		48	EACH
PLUG, PVC, 6" WITH PULL TAB	285-103-00030	D6P	32	EACH
BELL FITTING PVC 6 INCH SCHEDULE 40	285-103-00040	D6F	32	EACH
CEMENT PVC QUARTS WITH BRUSH 24 HR DRY	285-199-00090	DMG	4	EACH
SPACER, BASE PVC, 6"	285-199-00170		120	EACH
SPACER, INTERMEDIATE PVC, 6"	285-199-00180		200	EACH
DETECTABLE MULE TAPE, 1250 LB, 3,000' REEL	450-024-00010		1	EACH
BUTYL MASTIC	892-370-00004		7	EACH

**NOTIFICATION OF DEMOLITION AND RENOVATION (FORM IL 532 1296 APC 430)**  
Illinois Environmental Protection Agency Form IL 532 1296 APC 430 (Rev. 06/03)

**BUREAU OF LOCAL ROADS AND STREETS  
INSERTED SPECIAL PROVISIONS (ISP)**

The Bureau of Local Roads and Streets Inserted Special Provisions (ISP) needed for this contract are included with this document for easy use and reference.



REC. NO. \_\_\_\_\_

**NOTIFICATION OF DEMOLITION AND RENOVATION**

IL 532 1296

APC 430

Rev.06/03

Illinois Environmental Protection Agency

P.O. Box 19276, Springfield, IL 62794-9276

**THIS INFORMATION IS REQUIRED, NESHAP 40CFR-SUBPART M-61.145, Rev. Nov. 20, 1990****ALL SECTIONS MUST BE COMPLETED TO AVOID NOTICE VIOLATION****1. TYPE OF NOTIFICATION** (O-Original/R-Revised/C-Canceled):**2. TYPE OF OPERATION** (R-Renovation/D-Demo/A-Annual/O-Ordered Demo/E-Emergency Renovation):**3. FACILITY DESCRIPTION** (Building Name):

Address:

City:

County:

State:

ZIP:

Location of Asbestos Containing Material (ACM) in structure:

Bldg. Size:

# of Flrs.

Age:

Present Use:

Prior Use:

Future Use (Demo):

**4. IS ASBESTOS PRESENT?** Y N**5. WORK HOURS:**\*

a.m.

p.m.

**6. SCHEDULED DATE DEMOLITION:**

Start:

Complete:

**7. SCHEDULED DATE ASBESTOS REMOVAL:**

Start:

Complete:

**8. REGULATED ASBESTOS  
CONTAINING MATERIAL TO BE  
REMOVED (RACM):****NONFRIABLE ASBESTOS NOT  
TO BE REMOVED (Demolition):**

CATEGORY I

CATEGORY II

**NONFRIABLE ASBESTOS TO BE  
REMOVED:**

CATEGORY I

CATEGORY II

Pipes (Ln. Ft.)

Surface Area (Sq. Ft.)

Volume (Cu. Ft.)

**9. ASBESTOS REMOVAL CONTRACTOR:**

Address:

City:

State, Zip:

Contact:

Phone:

**10. DEMOLITION CONTRACTOR:**

Address:

City:

State, Zip:

Contact:

Phone:

**11. OWNER NAME:**

Address:

City:

State, Zip:

Contact:

Phone:

**12. WASTE TRANSPORTER:**

Address:

City:

State, Zip:

Contact:

Phone:

**13. WASTE DISPOSAL SITE:**

Address:

City:

State, Zip:

Landfill Permit #:

Phone:

-AGENCY USE ONLY-

To Region 1 2 3

Date Received:

Input to ACTS:

Post Mark Date:

To Cook/City:

Champaign:

LaSalle:

Springfield:

Rockford:

Moline:

Marion:

14. PROCEDURE, INCLUDING ANALYTICAL METHOD, USED TO DETECT THE PRESENCE OF ASBESTOS.

ILLINOIS LICENSE NUMBER OF INSPECTOR:

NAME OF ANALYTICAL TESTING LABORATORY:

15. DESCRIPTION OF PLANNED DEMOLITION OR RENOVATION WORK:  
METHODS TO BE EMPLOYED INCLUDING DEMOLITION OR RENOVATION TECHNIQUES.

16. DESCRIPTION OF WORK PRACTICES AND ENGINEERING CONTROLS TO BE USED TO PREVENT EMISSIONS AT THE  
DEMOLITION OR RENOVATION SITE:

17. IS DEMOLITION ORDERED BY A GOVERNMENTAL AGENCY? Y N (If Yes, a signed copy of Order must be attached.)

Governmental representative ordering the activity:

Title:

Date of Order:

Ordered Demolition Date:

18. FOR EMERGENCY RENOVATIONS:

Date and Hour of Emergency:

Description of the Sudden, Unexpected Event (e.g. structure in danger of eminent collapse):

19. DESCRIPTION OF PROCEDURES TO BE FOLLOWED IN THE EVENT THAT UNEXPECTED ASBESTOS IS FOUND OR  
PREVIOUSLY NONFRIABLE ASBESTOS MATERIAL BECOMES CRUMBLLED, PULVERIZED, OR REDUCED TO POWDER.

20. I CERTIFY THAT AT LEAST ONE REPRESENTATIVE, TRAINED IN THE PROVISIONS OF 40 CFR PART 61,  
SUBPART M, SHALL BE ON-SITE DURING DEMOLITION OR RENOVATION, HAVING IN HIS OR HER POSSESSION,  
FOR INSPECTION, EVIDENCE THAT THE REQUISITE TRAINING HAS BEEN ACCOMPLISHED.

I CERTIFY THE ABOVE INFORMATION IS CORRECT. \_\_\_\_\_

Signature of Owner/Operator Date  
(Original Signature Only, Photocopy Not Valid)

A FILING FEE OF \$150 MUST BE PAID WITH EACH INITIAL 10-WORKING DAY NOTIFICATION REQUIRED BY  
THE ASBESTOS NESHAP. MAKE CHECKS PAYABLE TO ILLINOIS EPA AND MAKE NOTATION THAT IT IS  
FOR THE 10-WORKING DAY NOTIFICATION FEE. CASH AND CREDIT CARDS ARE NOT ACCEPTABLE. IF  
THE FEE IS NOT SUBMITTED WITH THE NOTIFICATION, THE NOTIFICATION WILL BE DEEMED  
IMPROPERLY FILED.

\*Not required under NESHAPS.

Mail this form to: IL Environmental Protection Agency, Attn: Asbestos Unit, P.O. Box 19276, Springfield, IL 62794-9276

**APPENDIX A**

**CITY OF NAPERVILLE**

**SECTION 500**

**WATER DISTRIBUTION SYSTEM**

**CONSTRUCTION STANDARDS**

**CITY OF NAPERVILLE  
SECTION 500 WATER DISTRIBUTION SYSTEM  
CONSTRUCTION STANDARDS**

**501 GENERAL**

The standards and requirements found in this article are for materials and construction of water mains within the City of Naperville, Illinois. Specific references made herein for manufactured materials such as pipe, hydrants, valves and fittings refer to designations for American Water Works Association (AWWA) or to the American National Standards Institute (ANSI). Nothing herein shall constitute or imply an endorsement by the City of Naperville of any one material over another.

**501.2 SPECIFICATIONS**

These specifications cover pipe and fittings and items normally used for water distribution systems. Special considerations will be covered in the plans and special provisions. Water distribution systems shall be constructed in accordance with the Standard Specifications for Water and Sewer Main Construction in Illinois, latest edition, except as modified herein. In cases of conflict between standards, the more restrictive standard shall apply, as determined by the City Engineer.

**501.3 START OF CONSTRUCTION**

Water main construction shall not start before acquiring an IEPA Construction Permit.

**502 PIPE**

**502.1 DUCTILE IRON PIPE**

Ductile Iron pipe shall conform to ANSI Specification A21.51 or AWWA C151. Class 52 minimum thickness designation. Casting, marking, testing, etc. shall be provided in accordance with applicable ANSI or AWWA standards.

**502.2 LINING FOR PIPES AND FITTINGS**

Cement lining shall be provided in accordance with ANSI A21.4 and AWWA C104.

**502.3 PIPE FITTINGS**

All cast and ductile iron fittings shall conform to the latest ANSI Specifications A21.10/AWWA C110 for short body, cast and ductile iron fittings 3 inches (76 mm) to 48 inches (1.22 m) in diameter. Ductile iron compact fittings 3 inches (76 mm) to 24 inches (610 mm) in diameter shall be in accordance with ANSI Specification A21.53/AWWA C153.

**503 PROTECTION OF WATER MAINS**

**503.1 GENERAL**

Water mains and water service lines shall be protected from sanitary sewers, storm sewers, house sewer service connections and drains as follows (per IEPA Section 653.119):

### 503.2 HORIZONTAL SEPARATION - WATER MAINS AND SEWERS

- a) Water mains may be located closer than ten (10) feet (3.1 m) (clear separation) to a sewer line when:
  - 1) local conditions prevent a lateral separation of ten (10) feet (3.1 m); and
  - 2) the water main invert is at least 18 inches (460 mm) above the crown of the sewer; and
  - 3) The water main is either in a separate trench or in the same trench on an undisturbed earth shelf where the invert of the water main is eighteen (18) inches (460 mm) above the crown of the sanitary sewer located to one side of the sewer.
- b) When it is impossible to meet the above conditions, the sewer shall be constructed of water main quality pipe (PVC SDR 26 in accordance with ASTM D 2241 or ductile iron pipe class 52). This is to be done in lieu of "spot" lowering or raising the water main when possible.

### 503.3 VERTICAL SEPARATION WATER MAINS AND SEWERS

- a) A water main shall be separated from a sewer so that its invert is a minimum of 18 inches (460 mm) above the crown of the drain or sewer whenever water mains cross storm sewers, sanitary sewers or sewer service connections. The vertical separation shall be maintained for that portion of the water main located within ten (10) feet (3.1 m) (clear separation) horizontally of any sewer or drain crossed. A length of water main pipe shall be centered over the sewer to be crossed with joints equidistant from the sewer or drain.
- b) Both the water main and sewer shall be constructed of water main quality pipe when:
  - 1) It is impossible to obtain the proper vertical separation as described in (1) above; or
  - 2) The water main passes under a sewer or drain for a clear distance of ten (10) feet (3.1 m) on either side of the water main and be pressure tested to ensure water-tightness. Spot lowering of water mains shall only be permitted in cases of direct conflict when spot raising is not possible. Where a storm sewer crosses over a water main, the storm sewer shall either be constructed of water main quality pipe or of reinforced concrete pipe with rubber gasket joints conforming to ASTM C 361 or C443.
- c) A vertical separation of 18 inches (460 mm) between the invert of the sewer or drain and the crown of the water main shall be maintained where a water main crosses under a sewer. The sewer or drain lines shall be supported to prevent settling and breaking the water main, as shown on the plans or as approved by the City Engineer.
- d) The protection shall extend on each side of the crossing until the perpendicular distance from the water main to the sewer or drain line is at least ten (10) feet (3.1 m) clear separation.

## 504 PIPE INSTALLATION FOR WATER MAINS

### 504.1 GENERAL

Pipe shall be installed in accordance with ANSI/AWWA Standard C600-93 (or latest edition), except as modified herein. Pipe installed in casings shall be done in accordance with the requirements of Section 304.7 of these specifications.

### 504.2 EXCAVATION AND BACKFILL

Excavation and backfill for water mains shall conform to the provisions of Section 20, 21 and 22 of the Standard Specifications for Water Sewer Main Construction in Illinois, latest edition, except as modified herein.

### 504.3 DEPTH OF PIPE COVER

Unless otherwise shown on the plans or indicated in the Special Provisions, all pipe shall be installed with a minimum of 5 feet (1.5 m) of ground cover, measured from the proposed grade to the top of the pipe. In areas subject to subsequent excavation or fill, the mains shall be laid to the grades shown on the plans.

### 504.4 PIPE FOUNDATIONS

The trench shall have a flat bottom conforming to the grade to which the pipe is laid. The pipe shall be laid on sound aggregate bedding, no less than four (4) inches (100 mm) in depth, true to grade and shall have a firm bearing for the full length of pipe. Any part of the trench excavated below grade shall be corrected with trench backfill material and thoroughly compacted. Aggregate bedding shall conform to IDOT gradation CA-11.

### 504.5 DEWATERING OF TRENCH

Where water is encountered in the trench, the water shall be removed during pipe laying and jointing operations. Provisions shall be made to prevent floating of the pipe. Trench water shall not be allowed to enter the pipe at any time.

## 505 HANDLING OF PIPE

- a) All types of pipe shall be handled in such a manner as will prevent damage to the pipe or coating. Damaged pipe and other accessories shall be rejected and replaced to the satisfaction of the City Engineer. The methods of handling shall be corrected to prevent further damage when called to the attention of the contractor.
- b) The pipe and fittings shall be inspected by the contractor for defects while suspended above grade.
- c) Dirt or other foreign material shall be prevented from entering the pipe or pipe joint during handling or laying operations and any pipe or fitting that has been installed with dirt or foreign material in it shall be thoroughly cleaned. At times when pipe laying is not in progress, and at the end of each working day, the open ends of the pipe shall be closed by a water tight plug to ensure absolute cleanliness inside the pipe. The plugs shall not be removed until the trench has been dewatered to the satisfaction of the City Engineer.



## 506 LAYING OF PIPE

### 506.1 LAYING OF PIPE ON CURVES

- a) Long radius curves, either horizontal or vertical, may be laid with standard pipe by deflections at the joints.
- b) Where field conditions require deflection of pipe not shown on the plans, the City Engineer must give prior approval of the methods to be used.
- c) Maximum deflections at pipe joints and laying radius for various pipe lengths are as found in the following standards:
  - 1) Ductile Iron Pipe Mechanical Joints: AWWA C600-93 (or latest edition)
  - 2) Ductile Iron Pipe Push-On Joints: AWWA C600-93 (or latest edition)
  - 3) At no time shall the deflection of the pipe joints exceed the manufacturer's maximum recommended deflection.

### 506.2 JOINTS FOR DUCTILE IRON PIPE

Joints for ductile iron pipe shall consist of one of the two following types unless otherwise provided in the special provisions:

- a) Mechanical Joints with high-strength, low alloy T-bolts
- b) Push-On Rubber Gasket Joints
- c) Gaskets for water main located within 100 feet of a vehicle fueling facility shall be Buna N or Fluorocarbon rubber.

### 506.3 JOINTING MECHANICAL JOINT PIPE

- a) Jointing procedures shall be in accordance with AWWA C600-93 (or latest edition). The outside of the spigot and the inside of the bell shall be cleaned. Lubrication and additional cleaning shall be provided by brushing both the gasket and plain end with an approved pipe lubricant meeting the requirements of ANSI/AWWA C111/A21.11, just prior to slipping gasket onto the plain end for joint assembly. The gland shall be placed on the plain end with the lip extension toward the plain end, followed by the gasket with the narrow edge of the gasket toward the plain end.
- b) The pipe shall be inserted into the socket and the gasket shall be pressed firmly and evenly into the gasket recess. The joint shall be kept straight during assembly.
- c) The gland shall be pushed toward the socket and centered around the pipe with the gland lip against the gasket. The bolts shall be inserted and the nuts hand tightened.

- d) The bolts shall be tightened to the normal range of bolt torque as specified in AWWA C600-93 (or latest edition) (75-90 ft-lbs [102-122 N-m] for pipes 4 inches to 24 inches [102 mm to 610 mm]), while at all times maintaining approximately the same distance between the gland and the face of the flange at all points around the socket.
- e) Nuts spaced 180 degrees shall be tightened alternately in order to produce an equal pressure on all parts of the gland.

#### 506.4 JOINTING PUSH-ON JOINT PIPE

- a) Jointing procedures shall be in accordance with AWWA C600-93 (or latest edition). The inside of the bell shall be thoroughly cleaned to remove all foreign matter from the joint. The circular rubber gasket shall be inserted in the gasket seat provided.
- b) A thin film of approved gasket lubricant shall be applied to the inside surface of the gasket. Gasket lubricant shall be a solution of vegetable soap or other solution supplied by the pipe manufacturer and approved by the City Engineer. The lubricant shall be approved for use with potable water. The spigot end of the pipe shall be cleaned and entered into the rubber gasket in the bell, using care to keep the joint from contacting the ground. The joint shall then be completed by forcing the plain end to the seat of the bell. Care must be taken not to damage exterior coating or interior linings while forcing the joint. A timber header or other suitable means shall be used to push the pipe "home", to avoid damage to the pipe.
- c) Field-cut pipe lengths shall be beveled to avoid damage to the gasket and facilitate making the joint.
- d) All pipe shall be furnished with a depth mark to assure that the spigot end is inserted to the full depth of the joint.

#### 506.5 THRUST BLOCKING AND TIE RODS

Blocking to prevent movement of lines under pressure at bends, tees, caps, valves and hydrants shall be portland cement concrete, a minimum of 12" (300 mm) thick, placed between solid ground and the fittings (see standard detail WATER 6), and shall be anchored in such a manner that pipe and fitting joints will be accessible for repairs. The portland cement concrete shall meet or exceed a compressive strength of 3500 psi (24,000 kPa) after 28 days.

All bends of 11-1/4 degrees or greater, and all tees, crosses and plugs shall be thrust protected to prevent movement of the lines under pressure as shown on the plans.

Where unstable soil and/or backfill conditions exist, it may be necessary to install thrust blocking at deflected sections as well as at fittings. If required by the City Engineer, deflection blocking shall be installed at a point approximately 1/5 (one-fifth) of the pipe length each side of the coupling. Couplings/sleeves shall be restrained with approved retainer glands.

Tie rods shall be 5/8" (16 mm) diameter (minimum) stainless steel, grade 304. Eye bolts shall be high strength, low alloy steel.

Where conditions prevent the use of concrete thrust blocks, tied joints or restrained joints of a type approved by the City Engineer shall be used.

#### **506.6 RETAINER GLANDS**

The contractor may elect to use mechanical joint wedge action retainer glands in lieu of tie-rods. Mechanical joint wedge action retainer glands, when required to restrain valves, fittings, hydrants, and pipe joints shall be:

- a) MEGALUG 1100 Series as manufactured by EBAA IRON, INC., or
- b) Uni-Flange Blockbuster 1400 Series from Ford Meter Box Co.

For use on ductile iron pipe conforming to ANSI/AWWA C151/A21.51, nominal pipe sizes 3" (75 mm) through 48" (1.2 m). Existing ductile iron systems requiring restraint shall be Series 1100SD (split MEGALUG) for mechanical joints. Restraint system for restraining push-on pipe bells shall be MEGALUG Series 1100HD, or FORD Series 1390. Installation shall be per manufacturers' recommended procedures, including length and/or number of joints to be restrained.

Note: Thrust blocking shall be required behind fire hydrant assemblies in addition to the use of retainer glands and/or tie rods. The use of set screw type retainer glands shall not be permitted for use within the City of Naperville.

Use of approved retainer glands does not eliminate the need for thrust blocking at fittings and valves unless approved by the Department of Public Utilities after review of the appropriate supporting calculations.

#### **506.7 CONNECTIONS TO EXISTING MAINS**

A representative from the Department of Public Utilities must be present at all connections to existing water mains. Connections to existing water mains shall be accomplished without interruption of service. Pressure tapping saddles/valves are to be provided at the point of connection to the existing system. Connections shall be made in accordance with Standard Details WATER 8 and WATER 9, and in accordance with Section 46 of the Standard Specifications for Water and Sewer Main Construction in Illinois. The outside surface of the existing main and the inner face of the tapping sleeve shall be disinfected with a 1 % chlorine solution.

#### **506.8 ELECTRICAL CONTINUITY**

When required by the City Engineer, all pipe fittings, valves, etc. shall be connected so that electrical current flow will not be reduced. Acceptable methods shall include continuity wedges, fused bell and spigot and brass inserts for push-on joints.

## 507 PRESSURE TESTING AND FLUSHING OF WATER MAINS

### 507.1 HYDROSTATIC TEST

- a) The newly laid water mains or any valved sections of it shall be subjected to a hydrostatic pressure test of no less than one-hundred and fifty (150) pounds per square inch (psi) (1030 kPa), or 50% more than the operating pressure, whichever is greater.
- b) The duration of each pressure test shall be for a period of not less than four (4) hours. The maximum allowable pressure drop shall be 25 psi (170 kPa).
- c) The pressure test gauge shall be glycerin or oil filled, with a range of not more than 200 psi (1400 kPa) and increments not greater than 5 psi (35 kPa).

### 507.2 PROCEDURE FOR TEST

Each valved section of pipe shall be slowly filled with water and flushed (see Section 508). The specified test pressure shall be applied by means of a pump connected to the pipe in a satisfactory manner. Water used shall be metered. The pump to pipe connection and all necessary apparatus including gauges and meters shall be furnished by the contractor. Before applying the specified test pressure, all air shall be expelled from the pipe. To accomplish this, taps shall be made, if necessary, at points of highest elevation and afterwards turned off and capped. All joints showing visible leaks shall be repaired or replaced until they are free from leaks. Any cracked or defective pipes, fittings, valves, or hydrants discovered in consequence of this pressure test shall be removed and replaced by the contractor with sound material and the test shall be repeated until satisfactory to the City Engineer. In no instance shall "Bell Joint Clamps" be permitted to repair leaks at push-on Joints.

### 507.3 PERMISSIBLE LEAKAGE

- a) Suitable means approved by the City Engineer shall be provided by the contractor for determining the quantity of water lost by leakage. The leakage test shall be conducted after satisfactory completion of the pressure test before being acceptable.
- b) Allowable leakage shall not be greater than that indicated in Table 5.
- c) Leakage is defined as the quantity of water to be supplied in the newly laid pipe or any valved section under test which is necessary to maintain the specified leakage test pressure after the pipe has been filled with water and the air expelled.
- d) Flanged pipe shall be watertight.

**TABLE 5**

Allowable leakage for pipeline per 1,000 feet (gallons per hour)

Avg. Test Pressure PSI	Pipe Size in Inches															
	2	3	4	6	8	10	12	14	16	18	20	24	30	36	42	48
200	0.21	0.32	0.43	0.64	0.85	1.06	1.28	1.48	1.70	1.91	2.12	2.55	3.19	3.82	4.46	5.09
175	0.20	0.30	0.40	0.59	0.80	0.99	1.19	1.39	1.59	1.79	1.98	2.38	2.98	3.58	4.17	4.77
150	0.19	0.28	0.37	0.55	0.74	0.92	1.10	1.29	1.47	1.66	1.84	2.21	2.76	3.31	3.86	4.41
125	0.17	0.25	0.34	0.50	0.67	0.84	1.01	1.18	1.34	1.51	1.68	2.01	2.52	3.02	3.53	4.03
100	0.15	0.23	0.30	0.45	0.60	0.75	0.90	1.05	1.20	1.35	1.50	1.80	2.25	2.70	3.15	3.60
80	0.14	0.20	0.27	0.41	0.54	0.68	0.81	0.95	1.08	1.22	1.35	1.62	2.03	2.44	2.84	3.25
60	0.12	0.18	0.23	0.35	0.47	0.59	0.70	0.82	0.94	1.06	1.17	1.41	1.76	2.11	2.46	2.82

Allowable leakage for pipeline per 1,000 m (liters per hour)

Avg. Test Pressure kPa	Pipe Size in Millimeters															
	50	75	100	150	200	250	300	360	410	460	510	610	760	910	1070	1220
1380	2.41	3.61	4.81	7.22	9.63	12.04	14.45	17.33	19.74	22.15	24.56	29.37	36.60	43.82	51.52	58.75
1210	2.25	3.38	4.51	6.76	9.02	11.27	13.53	16.23	18.49	20.29	23.00	27.50	34.27	41.03	48.24	55.01
1030	2.08	3.12	4.16	6.24	8.32	10.40	12.48	14.98	17.06	19.14	21.22	25.38	31.62	37.86	44.51	50.75
860	1.90	2.85	3.80	5.70	7.60	9.50	11.40	13.68	15.58	17.48	19.39	23.19	28.89	34.59	40.67	46.37
690	1.70	2.55	3.40	5.11	6.81	8.51	10.21	12.26	13.96	15.66	17.36	20.77	25.88	30.98	36.43	41.54
550	1.52	2.28	3.04	4.56	6.08	7.60	9.12	10.94	12.46	13.98	15.50	18.54	23.10	27.66	32.53	37.09
410	1.31	1.97	2.62	3.94	5.25	6.56	7.87	9.45	10.76	12.07	13.39	16.01	19.95	23.88	28.08	32.02

## 508 DISINFECTION OF WATER MAINS

### 508.1 FLUSHING

- a) Sections of pipe to be disinfected shall first be flushed to remove any solids or contaminated material that may have become lodged in the pipe. If no hydrant is installed at the end of the main, then a tap should be provided large enough to develop a velocity of at least 2.5 feet per second (0.762 m per second) in the main. One two and one-half (2 1/2) inch (63 mm) diameter hydrant opening will, under normal pressure, provide this velocity in pipe sizes up to and including twelve (12) inches (300 mm). See Table 6 for additional sizes.
- b) All taps required by the contractor for chlorination or flushing purposes or for temporary or permanent release of air, shall be provided by him as part of the construction of water mains. When completed, the copper tubing shall be removed and the corporation stop placed at the "off" position. After testing, all corporation stops in valve vaults shall be brass-capped to protect threads.

**TABLE 6.**

Required Orifice Sizes, In. (mm) to Flush Pipelines at 2.5 fps (0.76 mps)

PIPE SIZE In. (mm)	RESIDUAL PRESSURE, PSI (kPa)				
	20 (140)	40 (275)	60 (410)	80 (550)	100 (690)
4 (100)	1.11 (28)	0.94 (24)	0.85 (22)	0.79 (20)	0.75 (19)
6 (150)	1.64 (42)	1.38 (35)	1.24 (31)	1.16 (29)	1.09 (28)
8 (200)	2.23 (57)	1.88 (48)	1.69 (43)	1.58 (40)	1.49 (38)
10 (250)	2.75 (70)	2.31 (59)	2.09 (53)	1.94 (49)	1.84 (47)
12 (300)	3.34 (85)	2.81 (71)	2.54 (64)	2.37 (60)	2.24 (57)
14 (360)	3.86 (98)	3.25 (83)	2.94 (75)	2.73 (69)	2.58 (65)
16 (410)	4.31 (109)	3.63 (92)	3.28 (83)	3.05 (77)	2.88 (73)
18 (460)	4.98 (126)	4.19 (106)	3.78 (96)	3.52 (89)	3.33 (85)
20 (510)	5.53 (140)	4.65 (118)	4.20 (107)	3.91 (99)	3.70 (94)

NOTE: Standard hydrant nozzle sizes are 2.5 inch (63 mm) and 4.5 inch (114 mm)

### 509 REQUIREMENT OF CHLORINE

- a) Before being placed into service, all new water mains and/or extensions to existing mains shall be chlorinated so that an initial chlorine residual of at least 50 ppm is present, and that a chlorine residual of not less than 25 ppm remains in the water after standing twenty-four (24) hours in the pipe.
- b) For extensions and/or connections equal to or less than one pipe length ( $\leq 18$  ft [5.5 m]), the new pipe, fittings and valve(s) required for the connection/extension, may be spray or swab disinfected with a minimum 1 percent hypochlorite solution just prior to being installed.

- c) Before a tapping sleeve is installed, the exterior of the main to be tapped shall be thoroughly cleaned and swabbed with a 1 percent hypochlorite solution, as well as the interior surface of the sleeve.
- d) Fire service lines requiring disinfection shall have the permanent position indicating valve (OS&Y or approved equal) installed on the fire sprinkler riser prior to disinfection.

#### **509.1 FORM OF APPLIED CHLORINE**

Chlorine shall be applied by one of the methods which follow, subject to approval by the City Engineer.

- a) Liquid Chlorine - A chlorine gas-water mixture shall be applied by means of a solution-feed chlorinating device or the dry gas may be fed directly through proper devices for regulating the rate of flow and providing effective diffusion of the gas into the water within the pipe being treated. Chlorinating devices for feeding solutions of chlorine gas or the gas itself must provide means for preventing the back flow of water into the chlorine cylinder.
- b) Chlorine-Bearing Compounds in Water - In certain instances, when the usage of chlorine gas is not practical, such as in congested or confined areas, upon approval of the City Engineer, a chlorine bearing compound of known chlorine content, prepared in solution form, may be substituted for chlorine gas.

#### **509.2 POINT AND RATE OF APPLICATION**

- a) Point of application - The preferred point of application of the chlorinating agent is at the beginning of the pipeline extension or any valved section of it, and through a corporation stop inserted in the pipe. The water injector for delivering the chlorine-bearing water into the pipe should be supplied from a tap made on the pressure side of the gate valve controlling the flow into the pipe line extension. Alternate points of application may be used when approved or directed by the City Engineer.
- b) Rate of Application - Water from the existing distribution system, or other approved source of supply shall be controlled to flow very slowly into the newly laid pipeline during the application of the chlorine. The rate of chlorine mixture flow shall be a constant feed and in such proportion to the rate of water entering the newly laid pipe that the dosage applied to the water will be at least fifty (50) parts per million unless otherwise directed by the City Engineer.
- c) Retention Period - Treated water shall be retained in the pipe at least twenty-four (24) hours. After this period, the chlorine residual at pipe extremities and at other representative points shall be at least twenty-five (25) parts per million.
- d) Chlorinating Valves and Hydrants - After the process of chlorinating newly laid pipe, all valves internal to the isolated test section, or other appurtenances shall be operated while the pipeline is filled with the chlorinating agent and under normal operating pressure.

- e) Preventing Reverse Flow - Valves shall be manipulated so that the strong chlorine solution in the line being treated will not flow back into the existing distribution system supplying the water. Backflow valves are required on chlorine equipment piping.

#### **510 FINAL FLUSHING AND TESTING**

- a) Dechlorination/neutralization may be required by the City Engineer. The environment into which the chlorinated water is to be discharged shall be inspected. If there is any possibility that the chlorinated discharge will cause environmental damage, then a neutralizing chemical shall be added to the discharge water to thoroughly neutralize the chlorine residual remaining in the water (see AWWA C651, Appendix B).
- b) Following chlorination, all treated water shall be thoroughly flushed from the newly laid pipe at its extremity until the replacement water throughout its length shows, upon test, a residual not in excess of that carried in the source of supply.
- c) After flushing, water samples collected on two (2) successive work days from the treated piping system, as directed by the City Engineer, shall show satisfactory bacteriological results. Bacteriological analysis must be performed by a laboratory approved by the Director of the Illinois Department of Public Health and the City Engineer. A minimum of two samples is required. The actual number of samples will be determined by the City Engineer.
- d) Should the initial treatment result in an unsatisfactory bacterial test, the original chlorination procedure shall be repeated by the contractor until satisfactory results are obtained.
- e) Naperville Department of Public Utilities must be notified at least 48 hours prior to flushing. New water mains, including pressure tap valves, connected to an existing water main, and existing water main valves shall only be operated by Naperville Department of Public Utilities personnel.

#### **511 VALVES FOR WATER MAINS**

##### **511.1 DESCRIPTION**

- a) The valves shall be suitable for ordinary water works service, intended to be installed in a normal position on buried pipe lines or water distribution systems.
- b) For fire lines to buildings, the permanent valve must be in place prior to disinfection and sampling.
- c) The minimum requirements for all valves shall, in design, material and workmanship, conform to the standards of the latest AWWA C509 and C504. All materials used in the manufacture of water works valves shall conform to the AWWA standards designed for each material listed.
- d) Valves shall be installed where shown on the approved engineering plans.



## **511.2 MATERIALS**

- a) **Manufacture and Marking** - The valves shall be standard pattern and shall have the name or mark of the manufacturer, size and working pressure plainly cast in raised letters on the valve body. Valves may be approved from one of the following manufacturers: American, Clow, Waterous or Kennedy.
- b) **Type and Mounting:**
  - 1) The valve bodies shall be cast or ductile iron, mounted with approved non-corrosive metals. All wearing surfaces shall be of approved non-corrosive material.
  - 2) All valves sixteen (16) inches (405 mm) and less shall be resilient wedge gate valves with non-rising stems with upper and lower thrust collars. Waterways shall be smooth and have no groove or depression where foreign material can lodge and prevent sealing. The stem shall be bronze or other approved non-corrosive metal. All valves shall open by turning counterclockwise. Resilient wedge gate valves shall meet the standards of AWWA C509.
  - 3) All valves eighteen (18) inches (457 mm) and larger must be butterfly valves meeting AWWA C504 standards.
- c) **End Connections** - End connections of all valves shall be the mechanical joint type.

## **511.3 VALVE STEM SEALS**

Unless otherwise designated in the special provisions, all valves up to and including sixteen (16) inches (406 mm) in size, shall be furnished with O-Ring Stem Seals. Number, size and design shall conform to the AWWA Standard for R/W valve O-Ring Stem Seals.

## **511.4 WRENCH NUTS**

Wrench nuts shall be made of cast iron and shall be one and fifteen-sixteenths (1-15/16) inches (49 mm) square at the top, two (2) inches (50 mm) square at the base, one and three-fourths (1-3/4) inches (44 mm) high, unless otherwise designated in the Special Provisions. Nuts shall have a flanged base upon which shall be cast an arrow at least two (2) inches (50 mm) long showing the direction of the opening. The word "open" in one-half (1/2) inch (13 mm) or larger letters shall be cast on the nut to clearly indicate the direction of opening the valve.

## **511.5 TAPPING VALVES**

Tapping valves shall be furnished with flanged inlet and connections having a machined projection on the flanges to mate with a machined recess on the outlet flanges of the tapping sleeves and crosses. Tapping sleeve must be made of cast iron, ductile iron or heavy duty stainless steel. Tapping sleeves of stainless steel shall not be used for "size on size" installations.

After the surface disinfection, the tapping saddle or sleeve shall be mounted to the main and tapping valve to form a pressure-tight connection. The installation shall be pressure tested at operating pressure plus 50 percent, to insure the integrity of the installation. This shall be a hydrostatic test, introduced through a port on the tapping machine, or through a tapped

mechanical joint plug on the outlet side of the tapping valve. The tapping machine and the tapping valve and sleeve assembly shall be externally supported so that no additional weight is placed upon the main(s).

#### **511.6 INSERTING VALVES**

The materials, internal design, construction, workmanship, and manufacture's tests of inserting valves shall conform with AWWA Standard C-500 or the latest revision, as modified by the following:

- a) The inserting valves shall be of a ductile iron body, bronze-mounted, non-rising stem, double non-revolving disc, parallel seat, and side wedging construction.
- b) All grey-iron castings shall conform to the requirements of ASTM Specification A126 Class B (31,000 psi minimum tensile strength), or the latest revision.
- c) Valve stems shall be cast, forged or rolled bronze, free from defects.
- d) Valves shall have a mechanical joint bell end, one bell being larger than normal to accept the inserting sleeve. Bells shall contain elastomer gaskets permanently attached in a plane perpendicular to the centerline of the bore.
- e) Valves shall be rated at 150 psig test with 80 psig working water pressure
- f) No bypass will be required
- g) Valves shall be furnished for and installed in a horizontal conduit with the valve stem plumb over the center line of the pipe.
- h) Valves shall open to the left or counter-clockwise.
- i) Valve stem seals shall consist of conventional stuffing boxes, or "O-ring type seals. Gland bolts and nuts shall be of the same quality bronze as the valve stems.
- j) Inserting Sleeve- Each inserting valve shall be provided with a split sleeve of the stuffing box type. Said sleeve shall have a bell mechanical outlet outboard of the valve for sealing to the conduit. Wall thickness, materials of construction, and workmanship shall conform to AWWA Standard C-1000 or the latest revision.
- k) The Contractor shall submit three copies of all drawings, furnished by the manufacture, fully and distinctly illustrating and describing the insert valve and sleeve proposed to be furnished.
- l) Job Site Performance Tests – Prior to installation the valve shall be operated in the position that will assume in service and for the full length of gate travel in both directions to demonstrate the free and perfect functioning of all parts in the intended manner. Any defects of workmanship shall be corrected and test repeated until satisfactory performance is demonstrated.
- m) Insert valve to be A. P. Smith Insert Valve, or approved equal.

#### **511.7 HYDROSTATIC TEST PRESSURE AT FACTORY**

Each valve shall be tested at the factory for performance and operation prior to painting and shall be subjected to the following hydrostatic pressure tests: each three (3) inch (75 mm) to sixteen (16) inch (406 mm) R/W valve, shall be subjected to hydrostatic pressure test per AWWA C509-80. Each eighteen (18) inch (457 mm) to forty-eight (48) inch (1.22 m) butterfly valve shall be subjected to test pressures per AWWA C504.

#### **511.8 EPOXY COATINGS OF VALVES (AT FACTORY)**

Painting at Factory - After the factory test and inspection, all ferrous parts of the valves except finished or bearing surfaces shall have a fusion bonded epoxy coating which complies with AWWA C550.

#### **511.9 INSTALLATION OF VALVES**

- a) All valves shall be inspected upon delivery in the field to insure proper working order before installation. They shall be set and jointed to the pipe in the manner as set forth in the AWWA Standards for the type of connection ends furnished.
- b) All valves shall be provided with a standard valve chamber so arranged that no shock will be transmitted to the valve and the box or vault opening shall be centered over the operation nut, and the cast iron cover shall be set flush with the road bed or finished surface.
- c) After installation all valves shall be subjected to the field test for piping as outlined in Section 507 of these specifications. Should any defects in materials or workmanship appear during these tests, the contractor shall correct such defects with the least possible delay and to the satisfaction of the City.

### **512 VALVE VAULTS AND BOXES FOR WATER MAINS AND WATER SERVICES**

#### **512.1 GENERAL**

- a) This section shall apply to the construction of standard or special valve vaults, cast iron valve boxes and curb boxes, all in accordance with the Naperville Standards.
- b) Valve boxes/vaults must be free of debris, centered over operating nut and easily keyable.
- c) Valve boxes and extensions must be cast iron only (no plastic).
- d) Valve boxes/lids shall be Tyler, two-piece with drop lid, 6850 series (screw type, 5-1/4" shafts), or approved equal.

#### **512.2 MATERIALS**

Cover and Valve Box Castings - Castings with cast iron ring and cover and cast iron parts of valve boxes shall conform to the requirements of Standard Specifications for Gray Iron Castings, ASTM Designation A-48.

### **512.3 VAULT APPURTENANCES**

The following items shall apply to all vault structures:

- a) Vaults shall be furnished with a self-sealing frame and slotted cover (Neenah Foundry R-1772-CVH, East Jordan Iron Works 1022-3 or approved equal) with the word "WATER" imprinted on the cover in raised letters.
- b) Both the vault frame and cover shall have machined horizontal and vertical bearing surfaces.
- c) Pick holes shall not create openings through the vault cover.
- d) Vault frames shall be adjusted to proper grade utilizing reinforced precast concrete rings; brick or concrete blocks will not be allowed.
- e) Adjusting rings shall be securely sealed to the cone section or top barrel section of the vault using resilient, flexible, non-hardening preformed butyl mastic material (CONSEAL CS-102B or an equal approved by the City Engineer). This mastic shall be applied in such a manner that no surface water or ground water inflow can enter the vault through gaps between the top barrel section or cone section and the first adjusting ring, between adjusting rings, or between the last adjusting ring and the vault frame. Up to twelve inches (12") (300 mm) of adjusting rings may be installed on a given vault; however, no more than one (1) two inch (2") (50 mm) adjusting ring and no more than two (2) rings in total shall be used.
- f) A butyl mastic material (CONSEAL CS-102B or equal approved by the City Engineer) shall be used to provide a water tight seal between vault barrel sections, cone to barrel section, and the cone section to frame and cover.
- g) Seal tight valve vaults may be either pre-cast, or cast-in-place, with a minimum diameter of forty-eight (48) inches (1.22 m). On vaults with butterfly valves, eccentric cones shall be installed so that the opening of the cone is placed as close to the center line of the operation as possible (see Standard Detail WATER 4).

### **512.4 CAST IRON VALVE BOXES FOR GATE VALVES**

Adjustable cast iron valve boxes shall be set to position during backfilling operations so they will be in a vertical alignment to the valve operating stem. The lower casting of the unit shall be installed first in such a manner as to be cushioned and to not rest directly upon the body of the R/W valve or upon the water main. The upper casting of the unit shall then be placed in proper alignment into such an elevation that its top will be at final grade. Backfilling around both units shall be placed and compacted to the satisfaction of the Engineer.

### **512.5 CURB BOXES**

- a) Curb boxes (B-Boxes) shall be arch type, one (1) inch (25 mm) I.D. box with rod for a one (1) inch (25 mm) curb stop, and a one and one-quarter (1-1/4) inch (32 mm) I.D. curb

box for a one and one-quarter (1- 1/4) inch (32 mm) curb stop or larger with no rod. One (1) inch (25 mm) curb boxes shall have a one (1) inch (25 mm) threaded brass pentagon plug with the word "WATER" in raised letters on the cap (1- 1/4 inch [32 mm] curb boxes shall have a 1-1/4 [32 mm] inch plug). Curb boxes shall be capable of extensions and installed to finished grade, and shall conform to the depth of bury of the service line as provided in the Naperville Standard Detail WATER 1. "Pigtails" on customer side of curb stop are not allowed.

- b) When planting trees, the outside edge of the root ball shall be at least five (5) feet from the service box.
- c) Curb stops are to be compression type by Mueller, Ford or A.Y. McDonald.

### 513 FIRE HYDRANTS

#### 513.1 GENERAL

These specifications are to be used in conjunction with the AWWA Standard C502 for fire hydrants for ordinary water works service. Fire hydrants shall be installed at the locations shown on the approved engineering plans.

#### 513.2 MATERIALS

- a) All fire hydrants shall be 5-1/4" valve opening.
- b) All materials used in the production of fire hydrants for ordinary service shall conform to the specifications designated for each material listed in AWWA Standard C502.
- c) The hydrant shall be Waterous Pacer WB-67 5-1/4" (133 mm), Mueller A-421 5-1/4" (133 mm) valve opening, or Clow F-2500 5-1/4" (133 mm) valve opening and of a pattern approved by the City Engineer. The seat must be of bronze to bronze. The name or mark of the manufacturer and size of the valve opening shall be plainly cast in raised letters and so placed on the hydrant barrel as to be visible after the hydrant has been installed.
- d) Lugs, if required for harnessing the hydrant to the connection pipe from the main in the street, shall be provided on the bell of the elbow or on the hydrant bottom casting. A drawing of the lug construction shall be submitted for approval, on request of the City Engineer.
- e) Hydrants shall be breakaway/traffic style. Breaking devices shall be at the breakaway flange which will allow the hydrant barrel to separate at this point with a minimum breakage of hydrant parts in case of damage. There shall also be provided at this point, a safety stem coupling on the operating stem that will shear at the time of impact. Unless otherwise specified, all hydrants shall be equipped with o-ring stem seals. The breakaway flange is to be just above the proposed ground level per manufacturer specifications.

- f) Hydrant cap chains and chain hooks are not to be installed on hydrant. If any chains and chain hooks have been installed, they shall be removed prior to final acceptance.

### 513.3 HYDRANT DETAILS

- a) The dimensions and details of hydrants and nozzles, unless otherwise noted, shall be as follows:

Hydrant 6" (150 mm) Connection:

Hydrant connection pipe size inside diameter	6 inches	150 mm
Standpipe minimum inside diameter	6 inches	150 mm
Length of hydrant from bottom of hydrant connection to breakaway flange	5 ½ ft. bury depth min.	1.68 m bury depth min.
Valve opening diameter	5 ¼ inches	114 mm
Size of auxiliary gate valve	6 inches	150 mm
Hose nozzles, number and size	Two 2 ½ inch & 4 ½ inch	Two 63 mm & 114 mm

Hydrant 6" (150 mm) Connection Thread Details:

Steamer Nozzles, number and size	National Standard Hose Thread
Diameter at root of thread	National Standard Hose Thread
Pattern of thread	National Standard Hose Thread
Total length of threaded male nipple	National Standard Hose Thread

- b) All nozzles shall be fitted with cast iron threaded caps with operating nut of the same design and proportions as the hydrant stem nut. Caps shall be threaded to fit the corresponding nozzles and shall be fitted with suitable gaskets for positive water tightness under test pressures.
- c) The operating nuts on hydrant stem and nozzle caps shall be the same for all sizes of hydrants. Dimensions shall be as follows:
- 1) Pattern of Nut:      Pentagonal
  - 2) Height:      1-1/16 inch (27 mm)
  - 3) Size of Pentagon:   1.35 inch (34 mm) at bottom of nut 1.23 inch (31 mm) at top of nut measured from point to flat
- d) The hydrant valve shall open by turning to the left (counterclockwise).

#### **513.4 FACTORY HYDROSTATIC TEST**

Before the hydrant is painted at the factory, it shall be subjected to a minimum hydrostatic test of 300 pounds per square inch (2070 kPa) with the hydrant valve in a closed position and again with the hydrant valve in an open position

#### **513.5 PAINTING**

All iron parts of the hydrant, both inside and outside shall be thoroughly cleaned and thereafter painted with one coat of paint of a durable composition, and two additional exterior coats of Tneme-Gloss Safety Orange (#E0119) per National fire code specifications (final coat shall be applied after installation).

#### **513.6 CONSTRUCTION DETAILS**

Hydrants shall be plumb and shall be set so that the center of the hydrant port is a minimum of eighteen (18) inches (457 mm) to a maximum of twenty-four (24) inches (610 mm) above the surrounding finished grade ensuring the breakaway flange at proper ground height. All hydrants shall be inspected in the field upon delivery to the job to ensure proper operation before installation. A minimum of 1/4 cubic yard (0.23 cu m) of washed coarse stone shall be placed at and around the base of the hydrant to ensure proper drainage of the hydrant after use. The blocking of the hydrant shall consist of a wedge of portland cement concrete of not less than 1/4 cubic yard (0.23 cu m) extending from the hydrant to undisturbed soil and shall be so placed to form a barrier adjacent to the hydrant base top to counteract the pressure of water exerted thereon. Care shall be taken to insure that weep holes are not covered by concrete. The hydrant shall be set on a concrete block to ensure a firm bearing for the hydrant base. The hydrant valve and tee shall be interconnected by stainless steel rods or approved retainer glands. Locking or restrained fittings may be substituted only after prior approval from the City Engineer. The resetting of existing hydrants and moving and reconnection of existing hydrants shall be handled in a manner similar to the new installation. The contractor shall rotate and/or adjust the hydrants to the satisfaction of the department of Public Utilities. The hydrant settings shall follow the Naperville Standard Detail WATER 2.

#### **514 PROTECTION AGAINST CORROSION**

##### **514.1 POLYETHYLENE ENCASEMENT**

This covers material specifications and installation procedures for polyethylene encasement to the underground installations of gray, ductile and cast iron pipe and other related appurtenances or water main. Polyethylene encasement of all iron pipe shall be required unless a soils report submitted to the City by the Ductile Iron Pipe Research Association indicates that the soils in the area are not corrosive to iron pipe. Should corrosive soils be encountered during the installation of the pipe, then the pipe shall be encased in polyethylene wrap.

#### 514.2 MATERIALS

The material used for the job shall be in accordance with Table 7 as shown:

**Table 7**

**Raw Material Used to Manufacture Polyethylene Film**

Type, class, grade, & other characteristics shall be in accordance with ASTM Standard D-1238

Type	I
Class	A Natural Color or Black
Grade	E-1
Flow Rate (formerly Melt Index)	0.4 Maximum
Polyethylene Film	Volume resistivity minimum ohm-cm <sup>3</sup> =10 <sup>15</sup>
Tensile Strength	1200 psi (8270 kPa) Minimum
Elongation	300 percent minimum
Dielectric Strength	800 volts per mil. thickness minimum

#### 514.3 THICKNESS

Polyethylene film shall have a minimum thickness of 0.008 inch (8 mils) (0.203 mm). The minus tolerance of thickness shall not exceed 10 percent (10%) of the nominal thickness.

#### 514.4 TUBE SIZE OR SHEET WIDTH

Tube or sheet size for each pipe diameter shall be listed in Table 8.

**Table 8**

**Minimum Polyethylene Width - Inch (mm)**

Nominal Pipe Diameter inch	Flat Tube	Sheet
3 (25)	14 (355)	28 (710)
4 (100)	16 (405)	32 (810)
6 (150)	20 (510)	40 (1015)
8 (200)	24 (610)	48 (1220)
10 (250)	27 (685)	54 (1370)
12 (305)	30 (760)	60 (1525)
14 (355)	34 (865)	68 (1725)
16 (405)	37 (940)	74 (1880)
18 (455)	41 (1040)	82 (2080)
20 (510)	45 (1145)	90 (2285)
24 (610)	54 (1370)	108 (2745)
30 (760)	67 (1700)	134 (3405)
36 (915)	81 (2055)	162 (4115)
42 (1065)	95 (2415)	190 (4825)
48 (1220)	108 (2745)	216 (5485)
54 (1370)	121 (3075)	242 (6145)

#### 514.5 INSTALLATION GENERAL

Installation shall be in accordance with ANSI/AWWA C105/A21.5. The polyethylene encasement shall prevent contact between the pipe and the surrounding backfill and bedding



material but is not intended to be a completely air and water tight enclosure. Overlaps shall be secured by the use of adhesive tape, plastic string, or other material capable of holding the polyethylene encasement in place until backfilling operations are completed.

#### **514.6 PIPE WRAPPING**

The standard includes three different methods for the installation of polyethylene encasement on pipe. Methods A and B are for use with polyethylene tubes and method C for use with polyethylene sheets.

##### **514.6.1 METHOD A**

Cut polyethylene tube to a length approximately two (2) feet (600 mm) longer than that of the pipe section. Slip the tube around the pipe, centering it to provide a one (1)-foot (300 mm) overlap on each adjacent pipe section, and bunching it accordion fashion length-wise until it clears the pipe ends.

Lower the pipe into the trench and make up the pipe joint with the preceding section of pipe. A shallow bell hole must be made at joints to facilitate installation to the polyethylene tube.

After assembling the pipe joint, make the overlap of the polyethylene tube. Pull the bunched polyethylene from the preceding length of pipe, slip it over the end of the new length of pipe and secure in place. Then slip the end of the polyethylene from the new pipe section over the end of the first wrap until it overlaps the joint at the end of the preceding length of pipe.

Secure the overlap in place. Take up the slack width to make a snug, but not tight fit along the barrel of the pipe, securing the fold at quarter points.

Repair any rips, punctures, or other damage to the polyethylene with adhesive tape or with a short length of polyethylene tube cut open, wrapped around the pipe and secured in place. Proceed with installation of the next section of pipe in the same manner.

##### **514.6.2 METHOD B**

Cut polyethylene tube to length approximately one (1)-foot (300 mm) shorter than that of the pipe section. Slip the tube around the pipe, centering it to provide six (6) inches (50 mm) of bare pipe at each end. Make polyethylene snug, but not tight; secure ends as described elsewhere.

Before making up a Joint, slop a three (3)-foot (915 mm) length of polyethylene tube over the end of the preceding pipe section, bunching it accordion fashion lengthwise. After completing the joint, pull the three (3)-foot (915 mm) length of polyethylene over the joint, overlapping the polyethylene previously installed on each adjacent section of pipe by at least one (1)-foot (300 mm); make snug and secure each end as described elsewhere.

Repair any rips, punctures, or other damage to the polyethylene. Proceed with installation of the next section of pipe in the same manner.

##### **514.6.3 METHOD C**

Cut polyethylene sheet to a length approximately two (2) feet (600 mm) longer than that of the pipe section. Center the cut length to provide a one (1)-foot (300 mm) overlap on each adjacent pipe section, bunching it until it clears the pipe ends. Wrap the polyethylene around the pipe so

that it circumventially overlaps the top quadrant of the pipe. Secure the cut edge of polyethylene sheet at intervals of approximately three (3) feet (915 mm).

Lower the wrapped pipe into the trench and make up the pipe joint with the preceding section of pipe. A shallow bell hole must be made at joints to facilitate installation of the polyethylene. After completing the joint, make the overlap as described above.

Repair any rips, punctures or other damage to the polyethylene. Proceed with installation of the next section in the same manner.

#### **514.7 PIPE SHAPED APPURTENANCES WRAPPING**

Cover bends, reducers, offsets, and other pipe-shaped appurtenances with polyethylene in the same manner as the pipe.

#### **514.8 ODD SHAPED APPURTENANCES WRAPPING**

When valves, tees, crosses, and other odd-shaped pieces cannot be wrapped practically in a tube, wrap with a flat sheet or split length of polyethylene tube by passing the sheet under the appurtenance and bringing it up around the body. Make seams by bringing the edges together, folding over twice, and taping down. Handle width and overlaps at joints as described above. Tape polyethylene securely in place at valve stem and other penetrations.

#### **514.9 STAINLESS STEEL BOLTS**

When polyethylene encasement of pipe is required to protect against corrosion all bolts (for appurtenances and MJ connections) shall be stainless steel.

### **515 CONNECTION TO EXISTING WATER MAINS**

#### **515.1 CONNECTION TO EXISTING WATER MAINS**

Connections to all City water mains must be pressure tap connections unless otherwise approved by the City Engineer, as shown on the approved engineering plans.

#### **515.2 NOTIFICATION**

- a) When connecting to the end of an existing line, work must be coordinated with the Department of Works and the Department of Public Utilities with 48 hours notice. Personnel from the Department of Public Utilities are the only ones who are to operate water main valves. When water is needed to chlorinate new lines from adjacent City mains which are in service, Department of Public Utilities personnel must be present to operate or witness the contractor operation of existing City valves.
- b) When extending an existing line, the contractor must chlorinate and pressure test both new and valved section of existing lines in accordance with City standards.
- c) When connecting on to the end of an existing water main, where customers are already using the main, the following must be done:

- 1) Department of Public Utilities-CEE/CM Division must have a minimum of 48 hours notice prior to shut-down so that it may have appropriate time to notify affected customers.
- 2) Water service must be returned to existing customers as soon as possible.
- 3) When directed by the City, chlorinate line for 2 hours (existing customers B-box or meter valve is shut-off by contractor), and perform the following:
  - i) Open the hydrant "past" the closest newly installed valve, run the water for a period of at least five minutes, and until a .5 mg/liter chlorine residual achieved.
  - ii) After a sample is taken, and a normal system chlorine residual is achieved (not less than 0.2 mg/l), the newly installed valve is shut and all existing customers have been restored to full service, the samples shall then be taken to an IEPA approved laboratory.
  - iii) The following two days, after achieving a .5 mg/liter chlorine residual, samples must be taken to an IEPA certified laboratory. The contractor shall furnish lab reports documenting satisfactory results of the sample testing prior to water service being restored.

#### 516 UTILITY IDENTIFICATION

- a) A wood 4"x4"x6' (100 mm x 100 mm x 2 m) stake with not less than the top two (2) feet (600 mm) painted blue shall be installed next to each water vault, buffalo box, and valve box for protection of that appurtenance. The stake (4"x4"x6') shall be maintained in a plumb position.
- b) When newly poured curbs are installed, the contractor shall use a city approved stamp to indent the wet concrete with a "W" to identify the location of each water vault, buffalo box, and valve box. The letter "W" will be indented at the top of the curb one and one-half (1-1/2) inch (38 mm) to two (2) inches (50 mm) in height and width and at a depth of three-eighths (3/8) inch (10 mm).

If the developer and/or the contractor fail to indent the curbs as outlined above, the City Engineer may require that identification medallions, or other symbols approved by the City Engineer, be affixed to the curb.

## **APPENDIX B**

## **LANDSCAPING**

SECTION 02900  
PLANTING

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes:

1. Trees, shrubs and perennials.
2. Providing and installing items related to planting.
3. Repairing existing areas damaged by Work.

1.02 SUBMITTALS

A. Product Data:

1. List indicating source of plant material to be provided, at least 1 week prior to digging.
2. Product Data, rates of application, and anticipated uses of pesticides, herbicides, and fumigants.

B. Samples:

1. When specified, submit samples and certified analyses by recognized laboratory approved by ENGINEER for topsoil, humus, fertilizer, fungicide, insecticide, tree paint, and antidesiccant before delivery. Manufacturer's analysis for standard products will be acceptable.
2. Approval shall not be construed as final acceptance. ENGINEER may take samples of materials delivered to site and analyze them for compliance with Specifications.

C. Miscellaneous:

1. Inspection certificates required by federal, state or other governing agency shall accompany each shipment.
2. Plant material shall comply with State of Illinois and federal laws with respect to inspection for plant diseases and insect infestation.

D. Submit all required samples, materials, certificates, product data, and invoiced to ENGINEER for approval.

1.03 QUALITY ASSURANCE

A. Qualifications:

1. CONTRACTOR shall be company specializing in landscape installation.
2. Perform planting by personnel familiar with accepted landscape planting procedures. Qualified foreman, representing CONTRACTOR, shall be on-site during planting procedures.

B. Ability to Deliver:

1. Investigate sources of supply and confirm they can supply plants mentioned on plant list in sizes, variety, and quality noted and specified before submitting bid. Failure to take this precaution will not relieve responsibility for furnishing and installing plant material in accordance with Contract Documents.

2. Substitutions may be permitted only upon submission of written proof that specified plant is not obtainable locally. Such substitution may be made upon written authorization by ENGINEER. Adjustments will be made at no additional cost to OWNER. Container plants may be substituted for "B&B" designated plants if approved in writing by ENGINEER.

C. Inspection:

1. ENGINEER may inspect plant material at nursery. Such inspection shall be in addition to inspection at Site.
2. Upon delivery and before planting, ENGINEER will inspect plants.
3. Inspection and approval is for quality, size, and variety only, and in no way impairs right of rejection for failure to meet other requirements during progress of Work.
4. CONTRACTOR shall be present during required inspections or as may be required by ENGINEER.

D. Source Quality Control.

1. Certification: Landscape materials shall be from stock inspected and certified by authorized governmental agencies. Material shall comply with governmental regulations prevailing at supply source and project. All plant materials shall originate within 200 mile radius of the project site.
2. Plant material shall comply with State of Illinois and federal laws with respect to inspection for plant diseases and insect infestation.
3. When specified, provide analyses and tests of topsoil, fertilizer and humus in accordance with requirements of Association of Official Agricultural Chemists.
3. Plant names used in plant list are in accordance with "Standardized Plant Names," published by American Joint Committee on Horticulture Nomenclature (current edition).
4. Size and grading standards of plant materials shall be in accordance with American Association of Nurserymen, Inc. (AAN) Standard: American Standard for Nursery Stock (ANSI Z60.1).
5. Hortus Third, Cornell University, 1976.

1.04 DELIVERY, STORAGE, AND HANDLING

A. Preparation for Delivery:

1. Balled and Burlapped (B&B) Plants:
  - a. Dig and prepare for shipment in manner that will not damage roots, branches, shape, and future development of plant.
  - b. Originate from soil which will hold good ball and be wrapped with burlap or similar material, bound with twine or cord to hold balls firm and intact.
  - c. Ball Sizes: Not less than standard established by AAN for B&B stock.
2. Potted or Container Plants:
  - a. Provide container to hold ball shape protecting root mass during delivery and handling.

B. Delivery:

1. Schedule shipping to minimize on-site storage of materials.
2. Plant Material: Take precautions in accordance with best trade practices to ensure arrival of plant material at Site in good condition and without injury. Cover plants to prevent freezing, drying, transit injury, or other exposure that may be harmful. During shipment, plants shall not be bent, stacked, or bound in manner that damages bark, breaks branches, deforms root balls, or destroys natural shape.

3. Fertilizer: Deliver fertilizer to site in original, unopened containers bearing weight, manufacturer's guaranteed chemical analysis, name, trade name, trademark, and conformance to state law.
4. Notify ENGINEER 24 hrs before delivery of plant material.
5. Each shipment shall be accompanied by invoice showing sizes and varieties included.

a. Provide copy of invoice to ENGINEER upon delivery of plant material.

6. Deliver topsoil in an unfrozen and non-muddy condition.

C. Temporary Storage:

1. Storage of Plant Material:

- a. Set plants, which are not to be planted within 4 hrs, on ground and heal in with peat, soil, mulch or other approved media.
- b. Protect roots of plant material from drying or other possible injury.
- c. Water plants until planted.
- d. Plants shall not remain unplanted for longer than 2 days.

2. Store fertilizer, humus, and spray materials in weatherproof storage areas and in such manner their effectiveness will not be impaired.

1.05 PROJECT/SITE CONDITIONS

A. Inspection:

1. Prior to beginning Work, CONTRACTOR shall examine and verify acceptability of Site for conditions under which Work will be performed. Do not proceed with Work until unsatisfactory conditions have been corrected.
2. Starting Work constitutes acceptance of conditions under which Work is to be performed. After such acceptances, CONTRACTOR shall be responsible for correcting unsatisfactory and defective Work resulting from such unsatisfactory conditions.

B. Utilities:

1. CONTRACTOR shall have underground utilities located by servicing agencies.
2. In vicinity of utilities, hand excavate to minimize possibility of damage to underground utilities.

C. Water shall be provided by CONTRACTOR.

D. Planting Seasons:

1. Spring Planting: From time soil becomes workable to June 15. Plant bare root materials only during this season, but no later than June 1.
2. Fall Planting: September 1 to October 30. Plant evergreen shrub plantings no later than November 1, and evergreen tree plantings no later than October 30.
3. Summer Season: Planting shall be considered unseasonable and requires approval by ENGINEER.
4. Container Plants: Planting season designated above may be extended for container grown plants when approved by ENGINEER.
5. If special conditions exist which warrant installation outside normal planting seasons, CONTRACTOR shall submit written request to ENGINEER describing conditions and stating proposed variance. Approval to plant under such conditions shall in no way relieve CONTRACTOR from warranty.

E. Plant when weather and soil conditions are suitable in accordance with industry practices.

F. Protection:

1. Protect seeded and planted areas against damage by trespass and other Work until substantial completion.
2. Replace, repair, restake or replant lawn or plantings which are damaged.
3. If planting after lawn installation, protect lawn areas, and repair damage resulting from planting operations.
4. Where planting occurs in close proximity to other site improvements, protect features prior to commencing Work. Any items damaged due to planting operations shall be repaired to their original condition.

## 1.06 WARRANTY

A. During 2 yr correction period replace plants which have died, or are in dying condition, or which has failed to flourish so its usefulness or appearance has been impaired. Replace trees with dead main leader or crown which is 25% or more dead. CONTRACTOR is responsible for watering during the 1 yr correction period.

1. Replacement and Damages:

- a. Decisions of ENGINEER and OWNER for required replacements is final and binding upon CONTRACTOR.
- b. CONTRACTOR is responsible for repairing damage to property caused by defective workmanship and materials.

2. Exclusions:

- a. CONTRACTOR is not liable for replacement cost of plants damaged by deicing compounds, fertilizers, pesticides or other materials not specified in Contract Documents or not applied by CONTRACTOR, by relocating or removal by others, by acts of God, or by vandalism, and losses due to curtailment of water by local authorities.

## PART 2 PRODUCTS

### 2.01 PLANTS

A. General:

1. Plant material shall be nursery grown unless otherwise specified or approved in writing by ENGINEER. Plants shall have been grown within same hardiness zone as Project site or acclimated to conditions of same hardiness zone for minimum of 2 growing seasons. Hardiness zones shall conform to "Zones of Plant Hardiness" as provided by U.S. Department of Agriculture.
2. Unless specifically noted otherwise, plants shall be of selected specimen quality; have normal habit of growth; and be sound, healthy, vigorous plants with well developed root systems. Plants shall be free of disease, insect pests, their eggs or larvae, and injuries.
3. Do not prune before delivery. Prune at time of planting. Trees with damaged, crooked leader or multiple leaders, unless specifically specified, will be rejected. Trees with abrasion of bark, sun scalds, disfiguring knots or fresh cuts of limbs over 1-1/4 in. which have not completely calloused, will be rejected. Plants shall be freshly dug or container grown. Heeled-in plants or plants for cold storage are not acceptable unless CONTRACTOR makes such request in writing and plants are inspected and approved.



4. Plant Name and Size:

- a. Measure plants when branches are in normal position. Height and spread refer to plant's main body and not from branch tip to branch tip.
- b. Take caliper measurement at specified distance above root collar as described in ANSI Z60.1.
- c. If range of size is given, no plant shall be less than minimum size and not less than 50% of plants shall be as large as upper half of range specified.
- d. Measurements specified are minimum size acceptable and are measurements after pruning, where pruning is required. Plants meeting measurements specified, but not producing normal balance between height and spread, will be rejected.
- e. Shrubs shall be matched specimens from single block source.
- f. Plants shall be true to species and variety and conform to measurement specified in Plant Schedule, except plants larger than specified may be used if approved by ENGINEER. Use of such plants will not result in increase in Contract Price. If larger plants are approved, increase ball of earth in proportion to size of plant.
- g. Where plants larger than specified have been submitted in writing for approval and approved in writing by ENGINEER, CONTRACTOR shall assume responsibility of guarantee for plant in size as planted.

B. Balled and Burlapped Plants (B&B):

1. Dig plants with firm natural balls of earth of sufficient dia and depth to encompass fibrous and feeding root system necessary for full recovery of plant.
2. Plants having balls broken or cracked during delivery or at time of planting will be rejected.
3. Ball sizes shall meet or exceed requirements of ANSI Z60.1.
4. ENGINEER may reject plants specified as B&B which, in ENGINEER'S opinion, fail to conform to balling requirements.

C. Bare Root Plants (BR):

1. Dig shrubs marked BR at nursery without injury to fibrous root system necessary for full recovery of plant.
2. Cover root with thick coating of mud by puddling or wrap in wet straw, moss or other suitable packing material immediately after they are dug for protection until delivery and installation.
3. Root Spread:

Height of Plant	Minimum Spread of Root (in.)
18 - 24 in.	10
2 - 3 ft	11
3 - 4 ft	14
4 - 5 ft	16
5 - 6 ft	18
6 - 8 ft	20

4. Maintain bare root plants in cold storage at approximately 30°F prior to being delivered to Site.

D. Container or Pot Grown Plants (Cont. or Pot):

1. Container grown plants shall have heavy fibrous root system, or well developed tap root, developed by proper horticultural practice including transplanting and root pruning, and shall have grown in container for at least 1 growing season.
2. Root system shall have developed sufficiently long for new fibrous roots to develop so root mass will retain its shape and hold together when removed from container.
3. Container shall not strangle or girdle natural growth of plant. Plants, other than groundcovers, over-established in container as evidenced by pot-bound root ends, will be rejected.

E. Bulbs, Corms or Tubers:

1. Healthy and viable, free from fungus and disease; and not dried out, desiccated or damaged by digging or handling. Provide proper period of rest.
2. Bulbs and corms shall meet dia or circumference as set forth in ANSI Z60.1.
3. Tubers shall have minimum of 2 "eyes" or buds.

F. Perennials, Biennials, Prairie Forbes, and Grasses:

1. Perennials, biennials, prairie forbes, and grasses specified as "container" or "pot" shall be provided as container-grown plants, or provided with firm natural balls of earth with dia and depth in accordance with ANSI Z60.1 for size specified on Plant List.
2. Ship balled plants in open air boxes or crates to minimize handling of each plant prior to installation. Do not plant balled plants if ball is cracked or broken before or during process of planting.

G. Collected Plants:

1. Plant material collected from native stands or established plantings shall be designated as such. Spread of roots, bare root or root balled trees shall be minimum of 1/3 greater in size than recommended for nursery grown stock in accordance with ANSI Z60.1.
2. Plant material collected from wild or native stands may be considered nursery-grown when successfully re-established in nursery row and grown under regular nursery cultural practices for minimum of 2 growing seasons and attained adequate root and top growth to indicate full recovery from transplanting into nursery row.

2.02 PLANTING MATERIALS

A. Topsoil:

1. Use on site topsoil as required to complete landscape work as shown on drawings. All topsoil proposed for use, whether from on-site or imported shall be tested at the CONTRACTOR's expense in accordance with Section 01455 or conformance to the specifications. On-site topsoil can be used to complete work required under this contract, provided it meets the requirements listed in Paragraph 2.04 or is amended with the appropriate soil amendment materials to meet these requirements.
2. Topsoil shall be fertile, friable, natural loam, taken from a naturally well drained site where topsoil occurs in a depth of not less than 4"; do not obtain from bogs or marshes. Topsoil shall be suitable for vigorous plant growth and not frozen or muddy.
3. Topsoil shall be free from subsoil, clay, brush, weeds, stones larger than one (1) inch in diameter, stalks, roots and other material that would be toxic or harmful to plant growth.
4. Acidity range pH 6.0-7.0, not less than 3% humus as determined by loss on ignition of moisture free samples dried at 100 degrees Centigrade. The ENGINEER reserves the right to reject topsoil in which more than 60% of material passing U.S.S. #100 sieve consists of clay as determined by the Bouyoucous Hydrometer by dried weights of materials. Analysis for organic matter and clay made in

accordance with current methods of the Association of Official Agricultural Chemists. Analysis paid for by Installer and may be required to be submitted for approval by the ENGINEER.

B. Soil Amendments:

1. Peat:

- a. Natural, domestic, or Canadian product, free of stones, taken from freshwater site.
- b. Not less than 80% decomposed organic matter by weight on oven-dried basis.
- c. Deliver peat in workable condition, free from lumps.

2. Manure:

- a. 2 to 3 yrs old, well rotted stable or cattle manure, free from shavings, sawdust, refuse, and other materials harmful to plant growth.

3. Superphosphate: Finely ground phosphate rock, agricultural grade, containing not less than 20% available phosphoric acid.

4. Granular Fertilizer:

- a. Commercial type, uniform in composition, free flowing, conforming to state and federal laws, and suitable for application with equipment designed for that purpose.
- b. Contain minimum basis percentage by weight:

- 1) Nitrogen: 6%, 1/4 of nitrogen shall be in form of nitrates, 1/4 in form of ammonia salts, and 1/2 in form of organic nitrogen.
- 2) Phosphorus: 24%, available phosphoric acid shall be derived from super phosphate having minimum analysis of 20% available phosphate.
- 3) Potash: 24%, potash shall be in form of sulphate or potash.
- 4) Balance of fertilizer shall be materials usually present in such products, free from dust, sticks, sand, stone, and other debris.

- c. Coordinate N-P-K requirements with soil testing lab recommendations.

5. pH Adjusters:

- a. Lime: Ground dolomite limestone, containing not less than 85% calcium and magnesium carbonates, 50% passing through 100 mesh screen, 98% passing 20 mesh screen.
- b. Elemental sulphur: Finely ground horticultural grade material containing at least 95% purity.

C. Mulch:

1. Processed Hardwood Bark:

- a. From mixed hardwood species and free of sticks and leaves, 60% shall range between 1 and 3 in. in length; remaining 40% shall not exceed 1-1/2 in.
- b. Maximum of 5% content by weight of shredded wood particles.

2. Mushroom Manure:

- a. Well rotted cattle or stable manure with admixture of 15% to 30% topsoil.
- b. Used for commercial growing of at least one crop of mushrooms.

D. Water:

1. Obtain from fresh water sources and free from injurious chemical or other toxic substances harmful to plant life.
2. No water which is brackish may be used.

E. Herbicide:

1. No herbicides are to be applied as part of this contract.

F. Tree Wrap:

1. Two thicknesses of waterproof crepe paper 6 to 10 in. wide, cemented together with bituminous material.
2. Twine: Minimum of 2-ply jute materials.

G. Staking and Guying Materials:

1. Hose:
  - a. Tree guy hose: New 2-ply fiber-bearing garden hose, not less than 1/2 in. inside dia.
  - b. Seconds rejected by factory are acceptable if approved by ENGINEER.
  - c. Use one color throughout project.
2. Wire: Tree guy wire shall be pliable No. 12 ga, galvanized wire.
3. Stakes: For guying trees, shall be 2 in. by 4 in. nominal construction grade lumber, 30 in. long and sharpened on one end.

H. Tree Paint:

1. Waterproof, adhesive, and elastic, free from kerosene, coal tar, creosote or other material injurious to life of tree.
2. Contain an antiseptic.

I. Planting Mixture for Plant Pits:

1. 6 parts topsoil or suitable existing soil thoroughly mixed with 2 parts peat and 1 part manure, plus 1 lb 6-24-24 fertilizer/cu yd of mixture.

J. Erosion Control Blanket:

1. The erosion control blanket shall be North American Green C125 BN. Contact information is: 14649 Highway 41, North Evansville, IN 47725. Phone 1-800-772-2040 or email [customerservice@nagreen.com](mailto:customerservice@nagreen.com)

PART 3 EXECUTION

3.01 PREPARATION

- A. Do not install plantings where depth of soil over underground construction, obstructions or rock is insufficient to accommodate roots or where pockets in rock or impervious soil require drainage.

1. Where such conditions are encountered in excavation planting areas and where stone, boulders or other obstruction cannot be broken or removed by hand methods and where trees to be planted are under overhead wires, alternate locations for planting may be designated by ENGINEER.
2. Where locations cannot be changed as determined by ENGINEER, submit cost required to remove obstructions to depth of not less than 6 in. below required pit depth. Proceed with Work after approval of ENGINEER.
3. Dispose of excavated material not suitable for backfilling off-site.
4. If drainage problems are encountered detrimental to growth of specified plant material, notify ENGINEER of conditions before proceeding with Work.

- B. Remove rock or other underground construction and drain planting areas only when approved by ENGINEER. Payment for extra work shall be based on in-place volume required to provide normal requirements for plantings.

### 3.02 INSTALLATION

A. Topsoil/Finish Grading:

1. Do not place or work topsoil in frozen or muddy condition.
2. Finish grade is established final grade. No regrading is anticipated as part of this contract.
3. Where Drawings show existing grades of landscaped areas are not to be changed or if new grade is less than 4 in. above existing grades, remove enough material to allow placement of 4 in. of new topsoil, unless existing topsoil to required depth is undisturbed and of equal or better quality than topsoil specified. In latter case, existing topsoil may be left in-place, using enough new topsoil to bring these areas up to grade.

B. Preparation:

1. Planting Season: Conform to planting seasons.
2. Preparation of Planting Areas: Cover surrounding turf (if existing) to protect turfed areas that are to be trucked or hauled over and upon which soil is to be temporarily stocked.
3. Stake or paint locations of plants and outlines of bed. ENGINEER will approve locations before excavation starts. Make adjustments in locations and outlines as required. If pits or areas for planting are prepared and backfilled with topsoil to grade prior to commencement of lawn operations, mark so they can be readily located when planting proceeds.

C. Excavation for Planting:

1. Plant Pits:

- a. Circular pits with vertical sides and flat bottoms.
- b. Depth of pits for trees shall be suitable to accommodate ball, container or bare roots when plant is set to finished grade allowing for 6 in. of compacted, prepared soil in bottom of pit.
- c. If rotating augers or other mechanical diggers are used to excavate holes, scarify vertical sides of pits to eliminate impervious surfaces.

2. Shrub bed preparation:

- a. Excavate existing soil in shrub beds and replace with planting bed soil mixture.
- b. Planting beds shall be brought to smooth and even surface conforming to established grades.

D. Preparation for Planting:

1. Installation of erosion control blanket:

- a. The C125 BN erosion control blanket shall be installed per manufacturer's instructions. CONTRACTOR shall submit shop drawing of installation to ENGINEER 1 week prior to proposed installation. Location of the erosion control blanket will be determined by the ENGINEER in the field.

2. Preparation of Planting Pits:

- a. Loosen soil at bottom of pit to minimum depth of 4 in. by spading or other effective methods.
- b. Backfill pit with 6 in. layer of compacted, prepared soil.

3. Mulch:

- a. Placement of mulch in the planting beds will be determined by the ENGINEER in the field.

E. Planting:

1. Trees: See planting notes on contract drawings for species, size and location.

- a. Cut away burlap, rope, wire or other wrapping materials from top of ball and remove from pit. Do not remove burlap or ties from sides and bottom of root ball. If plastic wrap or other non-degradable materials are used in lieu of burlap, remove them before placing of backfill.
- b. Backfill planting pits approximately 2/3 full with prepared soil, add water and allow to settle. After water has been absorbed, fill planting pit with planting mixture and tamp to match finish grade. Form shallow saucer around each isolated plant pit with prepared soil.

2. Container-Grown Plants:

- a. Open and remove potted plants from containers.
- b. If growing medium is comprised of 75% or more of peat, perlite, sand or like material other than soil, pull visible roots away from container medium so as to leave roots partially exposed.
- c. Place plants in plant pit or trench and backfill with prepared soil among exposed roots. Continue backfilling and tamping in 6 in. layers until planting mixture is at final grade.

3. Bare Root Plants:

- a. Place plants which have been puddled in mud or peat and water solution in center of pit or trench.
- b. Cut off broken or frayed roots.
- c. Spread roots in natural position and backfill moist prepared soil among roots in 6 in. layers until planting mixture is at final grade.
- d. Form shallow saucer around each isolated plant pit with prepared soil.
- e. Water plants immediately after planting.

F. Pruning:

1. Prune new trees and shrubs at time of or after planting.
2. Prune in accordance with standard horticultural practices to retain natural habit and shape of plant.

3. Prune and remove dead wood, suckers, injured twigs and branches, badly formed or interfering limbs, and sufficient other growth to insure health and symmetrical growth of new wood. Up to one-third of branches may be removed.
4. Use clean, sharp tools.
5. Make cuts flush and clean, leaving no stubs.
6. For cuts greater than 3/4 in. in dia and bruises or scars on bark, trace injured cambium back to living tissue and remove. Smooth and shape wounds so as not to retain water.
7. Paint pruning cuts greater than 3/4 in. with tree paint.
8. Prune flowering trees only to remove dead or damaged branches. Do not remove main leader. In case of multiple leaders, preserve one that will best promote symmetry of tree, and remove or cut back rest.
9. Prune shrubs by removing broken branches, thinning out canes, and cutting back or removing unsymmetrical branches. Pruning shall result in loose outline conforming to general shape of shrub type. Do not use hedge shears.

G. Watering:

1. Water immediately after installation.
2. Water during period of temporary maintenance.
3. Provide hose and other equipment for watering.

3.03 CLEAN UP AND PROTECTION

- A. Remove excess and waste material daily.
- B. Remove soil or similar material brought onto paved areas, keeping areas broom clean.
- C. Upon completion of planting, remove excess soil, stones, and debris and dispose of off-site.
- D. Damage to existing landscape, pavements, or other site features as result of Work shall be repaired to its original condition.
- E. Protect landscape Work and materials from damage due to landscape operations, operations by other contractors and trades, and trespassers. Maintain protection during installation and maintenance periods.
- F. Any existing soil, which is not returned to the planting beds, shall be either stored on site for owner's use, or disposed of offsite in accordance with all regulatory requirements. Disposal of any soil in the river, which was disturbed during landscape installation, will result in termination of the contract. This landscape installation does not require a permit from the Village of Oak Brook nor from any other regulatory agency, providing that no materials are introduced into the river and no changes occur to the existing floodplain. CONTRACTOR agrees to undertake all project-related activities with these restrictions in mind.

3.04 MAINTENANCE

A. Maintenance:

1. Maintain plant material for the duration of the two year correction period.
2. Maintenance begins immediately after each plant is installed and shall include watering, necessary cultivation, weeding, pruning, disease and insect pest control, protective spraying, resetting of plants to proper grades or upright position, restoration of damaged planting saucers, and other procedures consistent with good horticultural practice necessary to ensure normal, vigorous, and healthy growth of plantings.
3. Remove and replace dead and unacceptable plants as their condition becomes apparent.

4. Upon completion of the correction period and final acceptance by the ENGINEER, OWNER assumes responsibility for plant maintenance, except as below.

### 3.05 REPLACEMENTS

- A. Replace plants which have died prior to substantial completion.
- B. Plants which die or require replacement for other reasons during two-year correction period shall be replaced as soon as possible during acceptable planting seasons.
  1. Spring Replacement Season: All plants - when ground becomes workable to June 15.
  2. Fall Replacement Season:
    - a. Deciduous plants: September 1 to November 15.
    - b. Evergreen plants: September 1 to October 15.
- C. Procedure:
  1. Dispose of removed plants off-site.
  2. Replacements shall be of same size and species as original plant unless otherwise approved by ENGINEER.
  3. Replacements shall be supplied and installed in accordance with Specifications.
  4. Restore areas damaged by replacement operations to original condition.
  5. Notify ENGINEER at conclusion of replacement program.
  6. ENGINEER will conduct inspection of replacements for determining final acceptance.

### 3.06 ACCEPTANCE

- A. Preliminary Planting Acceptance:
  1. Notify ENGINEER at conclusion of planting operations so ENGINEER can determine substantial completion by field inspection.
  2. Substantial completion requires:
    - a. Plant material conforms to Contract Documents with respect to quantity, quality, size, species, and location, except those items accepted or revised in field by ENGINEER.
    - b. Plant material shall be in healthy condition as defined under warranty.
  3. If ENGINEER rejects inspected area, dollar amount equal to replacement of cost of rejected portion of Work will be withheld from payment until such time as that portion is acceptable. Findings will be documented in field report and forwarded to OWNER and CONTRACTOR along with list of items that require correction or completion.
- B. Final Planting Acceptance:
  1. Final planting acceptance shall be granted after completion of replacement operations required to fulfill guarantee and after completion of the 1 year correction period.
  2. Final inspection of planting or phase of planting will be made by OWNER, CONTRACTOR, and ENGINEER.
  3. On or about expiration of 1 yr correction period, follow-up inspection will be made to determine replacements required to be made by CONTRACTOR in accordance with provisions of these Specifications. ENGINEER will document findings in field report, and forward copies to OWNER and CONTRACTOR. Items identified for replacement will be tagged during inspection with plastic flagging.



4. Upon completion of replacement program, ENGINEER will inspect to determine acceptability of required replacements. If acceptable, ENGINEER shall notify CONTRACTOR and OWNER, in writing, of final acceptance of Work.

\*\*\* END OF SECTION \*\*\*

SECTION 02952  
PLUG PLANTING

PART 1 GENERAL

1.01 DESCRIPTION

- A. This Work shall consist of furnishing, transporting, installing, and maintaining all plants required for the establishment of the plug planting areas as shown on the plans, or directed by the ENGINEER.

1.02 QUALITY ASSURANCE

- A. CONTRACTOR shall be experienced in the establishment of wetland and prairie vegetation.
- B. Planting shall be performed under observation of the ENGINEER.
- C. CONTRACTOR shall commence planting only upon completion of topsoil testing and amendment, as necessary, in accordance with Section 02900.

1.03 SUBMITTALS

- A. Submit planting plan and schedule to the ENGINEER for approval at least 30 days prior to the beginning of work. The planting plan shall include the species and number of each species, the planting method, and the start/finish dates. The origin of the plants shall be within a 200-mile radius of the project site. Species shall be native to DuPage County.
- B. Submit name and location of plant suppliers including origin and date of harvest for each of the various kinds of plants.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. Each species shall be handled and packed in the manner approved for that plant, having regard for the soil and climatic conditions at the time and place of digging and of delivery, and for the time that will be consumed while in transit or delivery. All precautions that are customary in good trade practice shall be taken to ensure the arrival of the plant materials in good condition.
- B. Plant materials shall be packed in such a manner as to ensure adequate protection against damage while in transit. The plant materials shall be carefully protected with wet material to ensure that the plants are delivered in a moist and cool condition.
- C. When shipment is made by enclosed vehicle, the vehicle shall be adequately ventilated to prevent "heating" in transit. Plugs shall be placed in containers to protect the root mass during delivery and handling.
- D. Schedule shipping to minimize on-site storage of materials. Plants shall not remain unplanted for longer than 3 days. Set plants which are not to be planted within 4 hours on ground and heel in with peat, soil, mulch or other approved media. Water plants as necessary until planted.
- E. Place erosion control blanket, North American Green C125BN, as shown on the drawings prior to placing the plugs. The plugs shall be installed into the blanket. The erosion control blanket shall be installed according to manufacturer's instructions. Location of the erosion control blanket will be determined by the ENGINEER in the field.

## PART 2 PRODUCTS

### 2.01 MATERIALS

- A. Plant materials shall be free from insects and diseases and shall have the appearance of normal health and vigor.
- B. Plant materials shall be true to their name as specified. The source of plant materials shall be within a 200-mile radius of the project location, within the same or a lower plant zone.
- C. All plant materials, including collected stock, shall comply with State and Federal laws with respect to inspection for plant diseases and insect infestations.
- D. Quantities to be planted shall consist of the plugs shown on the planting list on the contract drawings.
- E. Erosion control blanket shall be North American Green C125BN, installed according to manufacturer's instructions.

## PART 3 EXECUTION

### 3.01 PROTECTION

- A. All plants shall be packed or covered in such a manner as to ensure adequate protection against damage while in storage and during planting operations. All plants shall be kept moist and cool and not be subject to freezing, drying, or warming.

### 3.02 PLANTING TIME

- A. The CONTRACTOR shall install plant materials between May 15 and September 30, unless written permission is obtained from the ENGINEER.

### 3.03 PLANTING PROCEDURES

- A. The plugs shall be planted on approximately one foot centers along the shoreline as shown on the drawing details.
- B. All plants shall be planted at their proper depth and as shown on the plans.
- C. No plug species shall make up more than 25 percent of the total number of plugs used within an individual stream reach.
- D. Plugs shall be planted into the C125 BN erosion control blanket, installed prior to planting the plugs.

### 3.04 MAINTENANCE

- A. Non-vegetated areas larger than 1 linear foot shall be replanted.

\*\*\* END OF SECTION \*\*\*

**Disadvantaged Business Enterprise Participation**

Effective: September 1, 2000

Revised: June 1, 2004

**FEDERAL OBLIGATION.** The Department of Transportation, as a recipient of federal financial assistance, is required to take all necessary and reasonable steps to ensure nondiscrimination in the award and administration of contracts. Consequently, the federal regulatory provisions of 49 CFR part 26 apply to this contract concerning the utilization of disadvantaged business enterprises. This Special Provision will also be used by the Department to satisfy the requirements of the Business Enterprise for Minorities, Females, and Persons with Disabilities Act, 30 ILCS 575. For the purposes of this Special Provision, a disadvantaged business enterprise (DBE) means a business certified by the Department in accordance with the requirements of 49 CFR part 26 and listed in the DBE Directory or most recent addendum.

**CONTRACTOR ASSURANCE.** The Contractor makes the following assurance and agrees to include the assurance in each subcontract that the Contractor signs with a subcontractor:

The contractor, subrecipient or subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The contractor shall carry out applicable requirements of 49 CFR part 26 in the award and administration of federally-assisted contracts. Failure by the contractor to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy as the recipient deems appropriate.

**OVERALL GOAL SET FOR THE DEPARTMENT.** As a requirement of compliance with 49 CFR part 26, the Department has set an overall goal for DBE participation in its federally assisted contracts. That goal applies to all federal-aid funds the Department will expend in its federally assisted contracts for the subject reporting fiscal year. The Department is required to make a good faith effort to achieve the overall goal. The dollar amount paid to all approved DBE firms performing work called for in this contract is eligible to be credited toward fulfillment of the Department's overall goal.

**CONTRACT GOAL TO BE ACHIEVED BY THE CONTRACTOR.** This contract includes a specific DBE utilization goal established by the Department. The goal has been included because the Department has determined that the work of this contract has subcontracting opportunities that may be suitable for performance by DBE companies. This determination is based on an assessment of the type of work, the location of the work, and the availability of DBE companies to do a part of the work. The assessment indicates that, in the absence of unlawful discrimination, and in an arena of fair and open competition, DBE companies can be expected to perform 12 % of the work. This percentage is set as the DBE participation goal for this contract. Consequently, in addition to the other award criteria established for this contract, the Department will award this contract to a bidder who makes a good faith effort to meet this goal of DBE participation in the performance of the work. A bidder makes a good faith effort for award consideration if either of the following is done in accordance with the procedures set forth in this Special Provision:

- (a) The bidder documents that firmly committed DBE participation has been obtained to meet the goal; or

- (b) The bidder documents that a good faith effort has been made to meet the goal, even though the effort did not succeed in obtaining enough DBE participation to meet the goal.

**DBE LOCATOR REFERENCES.** Bidders may consult the DBE Directory as a reference source for DBE companies certified by the Department. In addition, the Department maintains a letting and item specific DBE locator information system whereby DBE companies can register their interest in providing quotes on particular bid items advertised for letting. Information concerning DBE companies willing to quote work for particular contracts may be obtained by contacting the Department's Bureau of Small Business Enterprises at telephone number (217)785-4611, or by visiting the Department's web site at [www.dot.state.il.us](http://www.dot.state.il.us).

**BIDDING PROCEDURES.** Compliance with the bidding procedures of this Special Provision is required prior to the award of the contract and the failure of the as-read low bidder to comply will render the bid nonresponsive.

- (a) In order to assure the timely award of the contract, the as-read low bidder must submit a Disadvantaged Business Utilization Plan on Department form SBE 2026 within seven (7) working days after the date of letting. To meet the seven (7) day requirement, the bidder may send the Plan by certified mail or delivery service within the seven (7) working day period. If a question arises concerning the mailing date of a Plan, the mailing date will be established by the U.S. Postal Service postmark on the original certified mail receipt from the U.S. Postal Service or the receipt issued by a delivery service. It is the responsibility of the as-read low bidder to ensure that the postmark or receipt date is affixed within the seven (7) working days if the bidder intends to rely upon mailing or delivery to satisfy the submission day requirement. The Plan is to be submitted to the Department of Transportation, Bureau of Small Business Enterprises, Contract Compliance Section, 2300 South Dirksen Parkway, Room 319, Springfield, Illinois 62764 (Telefax: (217)785-1524). It is the responsibility of the bidder to obtain confirmation of telefax delivery. The Department will not accept a Utilization Plan if it does not meet the seven (7) day submittal requirement, and the bid will be declared nonresponsive. In the event the bid is declared nonresponsive due to a failure to submit a Plan or failure to comply with the bidding procedures set forth herein, the Department may elect to cause the forfeiture of the penal sum of the bidder's proposal guaranty, and may deny authorization to bid the project if re-advertised for bids. The Department reserves the right to invite any other bidder to submit a Utilization Plan at any time for award consideration or to extend the time for award.
- (b) The Utilization Plan shall indicate that the bidder either has obtained sufficient DBE participation commitments to meet the contract goal or has not obtained enough DBE participation commitments in spite of a good faith effort to meet the goal. The Utilization Plan shall further provide the name, telephone number and telefax number of a responsible official of the bidder designated for purposes of notification of plan approval or disapproval under the procedures of this Special Provision.
- (c) The Utilization Plan shall include a DBE Participation Commitment Statement, Department form SBE 2025, for each DBE proposed for the performance of work to achieve the contract goal. The signatures on these forms must be original signatures. All elements of information indicated on the said form shall be provided, including but not limited to the following:

- (1) The name and address of each DBE to be used;
  - (2) A description, including pay item numbers, of the commercially useful work to be done by each DBE;
  - (3) The price to be paid to each DBE for the identified work specifically stating the quantity, unit price and total subcontract price for the work to be completed by the DBE. If partial pay items are to be performed by the DBE, indicate the portion of each item, a unit price where appropriate and the subcontract price amount;
  - (4) A commitment statement signed by the bidder and each DBE evidencing availability and intent to perform commercially useful work on the project; and
  - (5) If the bidder is a joint venture comprised of DBE firms and non-DBE firms, the plan must also include a clear identification of the portion of the work to be performed by the DBE partner(s).
- (d) The contract will not be awarded until the Utilization Plan submitted by the bidder is approved. The Utilization Plan will be approved by the Department if the Plan commits sufficient commercially useful DBE work performance to meet the contract goal. The Utilization Plan will not be approved by the Department if the Plan does not commit sufficient DBE performance to meet the contract goal unless the bidder documents that it made a good faith effort to meet the goal. The good faith procedures of Section VIII of this special provision apply. If the Utilization Plan is not approved because it is deficient in a technical matter, unless waived by the Department, the bidder will be notified and will be allowed no less than a five (5) working day period in order to cure the deficiency.

**CALCULATING DBE PARTICIPATION.** The Utilization Plan values represent work anticipated to be performed and paid for upon satisfactory completion. The Department is only able to count toward the achievement of the overall goal and the contract goal the value of payments made for the work actually performed by DBE companies. In addition, a DBE must perform a commercially useful function on the contract to be counted. A commercially useful function is generally performed when the DBE is responsible for the work and is carrying out its responsibilities by actually performing, managing, and supervising the work involved. The Department and Contractor are governed by the provisions of 49 CFR part 26.55(c) on questions of commercially useful functions as it affects the work. Specific counting guidelines are provided in 49 CFR part 26.55, the provisions of which govern over the summary contained herein.

- (a) DBE as the Contractor: 100% goal credit for that portion of the work performed by the DBE's own forces, including the cost of materials and supplies. Work that a DBE subcontracts to a non-DBE firm does not count toward the DBE goals.
- (b) DBE as a joint venture Contractor: 100% goal credit for that portion of the total dollar value of the contract equal to the distinct, clearly defined portion of the work performed by the DBE's own forces.
- (c) DBE as a subcontractor: 100% goal credit for the work of the subcontract performed by the DBE's own forces, including the cost of materials and supplies, excluding the purchase of materials and supplies or the lease of equipment by the DBE subcontractor

from the prime contractor or its affiliates. Work that a DBE subcontractor in turn subcontracts to a non-DBE firm does not count toward the DBE goal.

(d) DBE as a trucker: 100% goal credit for trucking participation provided the DBE is responsible for the management and supervision of the entire trucking operation for which it is responsible. At least one truck owned, operated, licensed and insured by the DBE must be used on the contract. Credit will be given for the full value of all such DBE trucks operated using DBE employed drivers. Goal credit will be limited to the value of the reasonable fee or commission received by the DBE if trucks are leased from a non-DBE company.

(e) DBE as a material supplier:

- (1) 60% goal credit for the cost of the materials or supplies purchased from a DBE regular dealer.
- (2) 100% goal credit for the cost of materials or supplies obtained from a DBE manufacturer.
- (3) 100% credit for the value of reasonable fees and commissions for the procurement of materials and supplies if not a regular dealer or manufacturer.

GOOD FAITH EFFORT PROCEDURES. If the bidder cannot obtain sufficient DBE commitments to meet the contract goal, the bidder must document in the Utilization Plan the good faith efforts made in the attempt to meet the goal. This means that the bidder must show that all necessary and reasonable steps were taken to achieve the contract goal. Necessary and reasonable steps are those which could reasonably be expected to obtain sufficient DBE participation. The Department will consider the quality, quantity and intensity of the kinds of efforts that the bidder has made. Mere *pro forma* efforts are not good faith efforts; rather, the bidder is expected to have taken those efforts that would be reasonably expected of a bidder actively and aggressively trying to obtain DBE participation sufficient to meet the contract goal.

(a) The following is a list of types of action that the Department will consider as part of the evaluation of the bidder's good faith efforts to obtain participation. These listed factors are not intended to be a mandatory checklist and are not intended to be exhaustive. Other factors or efforts brought to the attention of the Department may be relevant in appropriate cases, and will be considered by the Department.

- (1) Soliciting through all reasonable and available means (e.g. attendance at pre-bid meetings, advertising and/or written notices) the interest of all certified DBE companies that have the capability to perform the work of the contract. The bidder must solicit this interest within sufficient time to allow the DBE companies to respond to the solicitation. The bidder must determine with certainty if the DBE companies are interested by taking appropriate steps to follow up initial solicitations.
- (2) Selecting portions of the work to be performed by DBE companies in order to increase the likelihood that the DBE goals will be achieved. This includes, where appropriate, breaking out contract work items into economically feasible units to facilitate DBE participation, even when the prime contractor might otherwise prefer to perform these work items with its own forces.

- (3) Providing interested DBE companies with adequate information about the plans, specifications, and requirements of the contract in a timely manner to assist them in responding to a solicitation.
- (4) a. Negotiating in good faith with interested DBE companies. It is the bidder's responsibility to make a portion of the work available to DBE subcontractors and suppliers and to select those portions of the work or material needs consistent with the available DBE subcontractors and suppliers, so as to facilitate DBE participation. Evidence of such negotiation includes the names, addresses, and telephone numbers of DBE companies that were considered; a description of the information provided regarding the plans and specifications for the work selected for subcontracting; and evidence as to why additional agreements could not be reached for DBE companies to perform the work.
  - b. A bidder using good business judgment would consider a number of factors in negotiating with subcontractors, including DBE subcontractors, and would take a firm's price and capabilities as well as contract goals into consideration. However, the fact that there may be some additional costs involved in finding and using DBE companies is not in itself sufficient reason for a bidder's failure to meet the contract DBE goal, as long as such costs are reasonable. Also, the ability or desire of a prime contractor to perform the work of a contract with its own organization does not relieve the bidder of the responsibility to make good faith efforts. Prime contractors are not, however, required to accept higher quotes from DBE companies if the price difference is excessive or unreasonable.
- (5) Not rejecting DBE companies as being unqualified without sound reasons based on a thorough investigation of their capabilities. The contractor's standing within its industry, membership in specific groups, organizations, or associations and political or social affiliations (for example union vs. non-union employee status) are not legitimate causes for the rejection or non-solicitation of bids in the contractor's efforts to meet the project goal.
- (6) Making efforts to assist interested DBE companies in obtaining bonding, lines of credit, or insurance as required by the recipient or contractor.
- (7) Making efforts to assist interested DBE companies in obtaining necessary equipment, supplies, materials, or related assistance or services.
- (8) Effectively using the services of available minority/women community organizations; minority/women contractors' groups; local, state, and Federal minority/women business assistance offices; and other organizations as allowed on a case-by-case basis to provide assistance in the recruitment and placement of DBE companies.
- (b) If the Department determines that the Contractor has made a good faith effort to secure the work commitment of DBE companies to meet the contract goal, the Department will award the contract provided that it is otherwise eligible for award. If the Department determines that a good faith effort has not been made, the Department will notify the bidder of that preliminary determination by contacting the responsible company official designated in the Utilization Plan. The preliminary determination shall include a statement of reasons why good faith efforts have not been found, and may include additional good faith efforts that the bidder could take. The notification will designate a



five (5) working day period during which the bidder shall take additional efforts. The bidder is not limited by a statement of additional efforts, but may take other action beyond any stated additional efforts in order to obtain additional DBE commitments. The bidder shall submit an amended Utilization Plan if additional DBE commitments to meet the contract goal are secured. If additional DBE commitments sufficient to meet the contract goal are not secured, the bidder shall report the final good faith efforts made in the time allotted. All additional efforts taken by the bidder will be considered as part of the bidder's good faith efforts. If the bidder is not able to meet the goal after taking additional efforts, the Department will make a pre-final determination of the good faith efforts of the bidder and will notify the designated responsible company official of the reasons for an adverse determination.

- (c) The bidder may request administrative reconsideration of a pre-final determination adverse to the bidder within the five (5) working days after the notification date of the determination by delivering the request to the Department of Transportation, Bureau of Small Business Enterprises, Contract Compliance Section, 2300 South Dirksen Parkway, Room 319, Springfield, Illinois 62764 (Telefax: (217)785-1524). Deposit of the request in the United States mail on or before the fifth business day shall not be deemed delivery. The pre-final determination shall become final if a request is not made and delivered. A request may provide additional written documentation and/or argument concerning the issue of whether an adequate good faith effort was made to meet the contract goal. In addition, the request shall be considered a consent by the bidder to extend the time for award. The request will be forwarded to the Department's Reconsideration Officer. The Reconsideration Officer will extend an opportunity to the bidder to meet in person in order to consider all issues of whether the bidder made a good faith effort to meet the goal. After the review by the Reconsideration Officer, the bidder will be sent a written decision within ten (10) working days after receipt of the request for reconsideration, explaining the basis for finding that the bidder did or did not meet the goal or make adequate good faith efforts to do so. A final decision by the Reconsideration Officer that a good faith effort was made shall approve the Utilization Plan submitted by the bidder and shall clear the contract for award. A final decision that a good faith effort was not made shall render the bid nonresponsive.

**CONTRACT COMPLIANCE.** Compliance with this Special Provision is an essential part of the contract. The Department is prohibited by federal regulations from crediting the participation of a DBE included in the Utilization Plan toward either the contract goal or the Department's overall goal until the amount to be applied toward the goals has been paid to the DBE. The following administrative procedures and remedies govern the compliance by the Contractor with the contractual obligations established by the Utilization Plan. After approval of the Plan and award of the contract, the Utilization Plan and individual DBE Participation Statements become part of the contract. If the contractor did not succeed in obtaining enough DBE participation to achieve the advertised contract goal, and the Utilization Plan was approved and contract awarded based upon a determination of good faith, the total dollar value of DBE work calculated in the approved Utilization Plan as a percentage of the awarded contract value shall become the amended contract goal.

- (a) No amendment to the Utilization Plan may be made without prior written approval from the Department's Bureau of Small Business Enterprises. All requests for amendment to the Utilization Plan shall be submitted to the Department of Transportation, Bureau of Small Business Enterprises, Contract Compliance Section, 2300 South Dirksen

Parkway, Room 319, Springfield, Illinois 62764. Telephone number (217) 785-4611. Telefax number (217) 785-1524.

- (b) All work indicated for performance by an approved DBE shall be performed, managed and supervised by the DBE executing the Participation Statement. The Contractor shall not terminate for convenience a DBE listed in the Utilization Plan and then perform the work of the terminated DBE with its own forces, those of an affiliate or those of another subcontractor, whether DBE or not, without first obtaining the written consent of the Bureau of Small Business Enterprises to amend the Utilization Plan. If a DBE listed in the Utilization Plan is terminated for reasons other than convenience, or fails to complete its work on the contract for any reason, the Contractor shall make good faith efforts to find another DBE to substitute for the terminated DBE. The good faith efforts shall be directed at finding another DBE to perform at least the same amount of work under the contract as the DBE that was terminated, but only to the extent needed to meet the contract goal or the amended contract goal. The Contractor shall notify the Bureau of Small Business Enterprises of any termination for reasons other than convenience, and shall obtain approval for inclusion of the substitute DBE in the Utilization Plan. If good faith efforts following a termination of a DBE for cause are not successful, the Contractor shall contact the Bureau and provide a full accounting of the efforts undertaken to obtain substitute DBE participation. The Bureau will evaluate the good faith efforts in light of all circumstances surrounding the performance status of the contract, and determine whether the contract goal should be amended.
- (c) The Contractor shall maintain a record of payments for work performed to the DBE participants. The records shall be made available to the Department for inspection upon request. After the performance of the final item of work or delivery of material by a DBE and final payment therefor to the DBE by the Contractor, but not later than thirty (30) calendar days after payment has been made by the Department to the Contractor for such work or material, the Contractor shall submit a DBE Payment Report on Department form SBE 2115 to the District Engineer. If full and final payment has not been made to the DBE, the Report shall indicate whether a disagreement as to the payment required exists between the Contractor and the DBE or if the Contractor believes that the work has not been satisfactorily completed. If the Contractor does not have the full amount of work indicated in the Utilization Plan performed by the DBE companies indicated in the Plan, the Department will deduct from contract payments to the Contractor the amount of the goal not achieved as liquidated and ascertained damages.
- (d) The Department reserves the right to withhold payment to the Contractor to enforce the provisions of this Special Provision. Final payment shall not be made on the contract until such time as the Contractor submits sufficient documentation demonstrating achievement of the goal in accordance with this Special Provision or after liquidated damages have been determined and collected.

## Training Special Provisions

Effective: October 15, 1975

This Training Special Provision supersedes Section 7b of the Special Provision entitled "Specific Equal Employment Opportunity Responsibilities," and is in implementation of 23 U.S.C. 140(a).

As part of the contractor's equal employment opportunity affirmative action program, training shall be provided as follows:

The contractor shall provide on-the-job training aimed at developing full journeyman in the type of trade or job classification involved. The number of trainees to be trained under this contract will be 4. In the event the contractor subcontracts a portion of the contract work, he shall determine how many, if any, of the trainees are to be trained by the subcontractor, provided however, that the contractor shall retain the primary responsibility for meeting the training requirements imposed by this special provision. The contractor shall also insure that this Training Special Provision is made applicable to such subcontract. Where feasible, 25 percent of apprentices or trainees in each occupation shall be in their first year of apprenticeship or training.

The number of trainees shall be distributed among the work classifications on the basis of the contractor's needs and the availability of journeymen in the various classifications within the reasonable area of recruitment. Prior to commencing construction, the contractor shall submit to the Illinois Department of Transportation for approval the number of trainees to be trained in each selected classification and training program to be used. Furthermore, the contractor shall specify the starting time for training in each of the classifications. The contractor will be credited for each trainee employed by him on the contract work who is currently enrolled or becomes enrolled in an approved program and will be reimbursed for such trainees as provided hereinafter.

Training and upgrading of minorities and women toward journeyman status is a primary objective of this Training Special Provision. Accordingly, the contractor shall make every effort to enroll minority trainees and women (e.g. by conducting systematic and direct recruitment through public and private sources likely to yield minority and women trainees) to the extent such persons are available within a reasonable area of recruitment. The contractor will be responsible for demonstrating the steps that he has taken in pursuance thereof, prior to a determination as to whether the contractor is in compliance with this Training Special Provision. This training commitment is not intended, and shall not be used, to discriminate against any applicant for training, whether a member of a minority group or not.

No employee shall be employed as a trainee in any classification in which he has successfully completed a training course leading to journeyman status or in which he has been employed as a journeyman. The contractor should satisfy this requirement by including appropriate questions in the employee application or by other suitable means. Regardless of the method used the contractor's records should document the findings in each case.

The minimum length and type of training for each classification will be as established in the training program selected by the contractor and approved by the Illinois Department of Transportation and the Federal Highway Administration. The Illinois Department of Transportation and the Federal Highway Administration shall approve a program, if it is reasonably calculated to meet the equal employment opportunity obligations of the contractor and to qualify the average trainee for journeyman status in the classification concerned by the end of the training period. Furthermore, apprenticeship programs registered with the U.S. Department of Labor, Bureau of Apprenticeship and Training, or with a State apprenticeship agency recognized by the Bureau and training programs approved by not necessarily sponsored by the U.S. Department of Labor, Manpower Administration, Bureau of Apprenticeship and Training shall also be considered acceptable provided it is being administered in a manner consistent with the equal employment obligations of Federal-aid highway construction contracts. Approval or acceptance of a training program shall be

obtained from the State prior to commencing work on the classification covered by the program. It is the intention of these provisions that training is to be provided in the construction crafts rather than clerk-typists or secretarial-type positions. Training is permissible in lower level management positions such as office engineers, estimators, timekeepers, etc., where the training is oriented toward construction applications. Training in the laborer classification may be permitted provided that significant and meaningful training is provided and approved by the Illinois Department of Transportation and the Federal Highway Administration. Some offsite training is permissible as long as the training is an integral part of an approved training program and does not comprise a significant part of the overall training.

Except as otherwise noted below, the contractor will be reimbursed 80 cents per hour of training given an employee on this contract in accordance with an approved training program. As approved by the Engineer, reimbursement will be made for training of persons in excess of the number specified herein. This reimbursement will be made even though the contractor receives additional training program funds from other sources, provided such other source does not specifically prohibit the contractor from receiving other reimbursement. Reimbursement for offsite training indicated above may only be made to the contractor where he does one or more of the following and the trainees are concurrently employed on a Federal-aid project; contributes to the cost of the training, provides the instruction to the trainee or pays the trainee's wages during the offsite training period.

No payment shall be made to the contractor if either the failure to provide the required training, or the failure to hire the trainee as a journeyman, is caused by the contractor and evidences a lack of good faith on the part of the contractor in meeting the requirement of this Training Special Provision. It is normally expected that a trainee will begin his training on the project as soon as feasible after start of work utilizing the skill involved and remain on the project as long as training opportunities exist in his work classification or until he has completed his training program.

It is not required that all trainees be on board for the entire length of the contract. A contractor will have fulfilled his responsibilities under this Training Special Provision if he has provided acceptable training to the number of trainees specified. The number trained shall be determined on the basis of the total number enrolled on the contract for a significant period.

Trainees will be paid at least 60 percent of the appropriate minimum journeyman's rate specified in the contract for the first half of the training period, 75 percent for the third quarter of the training period, and 90 percent for the last quarter of the training period, unless apprentices or trainees in an approved existing program are enrolled as trainees on this project. In that case, the appropriate rates approved by the Departments of Labor or Transportation in connection with the existing program shall apply to all trainees being trained for the same classification who are covered by this Training Special Provision.

The contractor shall furnish the trainee a copy of the program he will follow in providing the training. The contractor shall provide each trainee with a certification showing the type and length of training satisfactorily complete.

The contractor will provide for the maintenance of records and furnish periodic reports documenting his performance under this Training Special Provision.

METHOD OF MEASUREMENT. The unit of measurement is in hours.

BASIS OF PAYMENT. This work will be paid for at the contract unit price of 80 cents per hour for TRAINEES. The estimated total number of hours, unit price and total price have been included in the schedule of prices.

## **Payments to Subcontractors**

Effective: June 1, 2000

Revised: September 1, 2003

Federal regulations found at 49 CFR §26.29 mandate the Department to establish a contract clause to require Contractors to pay subcontractors for satisfactory performance of their subcontracts no later than 30 days from the receipt of each payment made to the Contractor.

State law addresses the timing of payments to be made to subcontractors. Section 7 of the Prompt Payment Act, 30 ILCS 540/7, generally requires that when a Contractor receives any payment from the Department, the Contractor is required to make corresponding, proportional payments to each subcontractor performing work within 15 calendar days after receipt of the state payment. Section 7 of the State Prompt Payment Act further provides that interest in the amount of 2% per month, in addition to the payment due, shall be paid to any subcontractor by the Contractor if the payment required by the Act is withheld or delayed without reasonable cause. The Act also provides that the time for payment required and the calculation of any interest due applies to transactions between subcontractors and lower-tier subcontractors throughout the contracting chain.

This Special Provision establishes the required federal contract clause, and adopts the 15 calendar day requirement of the Act for purposes of compliance with the federal regulation regarding payments to subcontractors. This contract is subject to the following payment obligations.

As progress payments are made to the Contractor in accordance with Article 109.07 of the Standard Specifications for Road and Bridge Construction, the Contractor shall make a corresponding partial payment within 15 calendar days to each subcontractor in proportion to the work satisfactorily completed by each subcontractor. The proportionate amount of partial payment due to each subcontractor shall be determined by the quantities measured or otherwise determined as eligible for payment by the Department and included in the progress payment to the Contractor. Subcontractors shall be paid in full within 15 calendar days after the subcontractor's work has been satisfactorily completed. The Contractor shall hold no retainage from the subcontractors.

This Special Provision does not create any rights in favor of any subcontractor against the State of Illinois or authorize any cause of action against the State of Illinois on account of any payment, nonpayment, delayed payment or interest claimed by application of the State Prompt Payment Act. The Department will neither determine the reasonableness of any cause for delay of payment nor enforce any claim to payment, including interest. Moreover, the Department will not approve any delay or postponement of the 15 day requirement. State law creates remedies available to any subcontractor or material supplier, regardless of tier, who has not been paid for work properly performed or material furnished. These remedies are a lien against public funds set forth in Section 23(c) of the Mechanics Lien Act, 770 ILCS 60/23(c), and a recovery on the Contractor's payment bond in accordance with the Public Construction Bond Act, 30 ILCS 550.

## Partial Payments

Effective: September 1, 2003

Revise Article 109.07 of the Standard Specifications to read:

**"109.07 Partial Payments.** Partial payments will be made as follows:

- (a) **Progress Payments.** At least once each month, the Engineer will make a written estimate of the amount of work performed in accordance with the contract, and the value thereof at the contract unit prices. The amount of the estimate approved as due for payment will be vouchered by the Department and presented to the State Comptroller for payment. No amount less than \$1000.00 will be approved for payment other than the final payment.

The failure to perform any requirement, obligation, or term of the contract by the Contractor shall be reason for withholding any progress payments until the Department determines that compliance has been achieved. Furthermore, progress payments may be reduced by liens filed pursuant to Section 23(c) of the Mechanics Lien Act, 770 ILCS 60/23(c).

- (b) **Material Allowances.** At the discretion of the Department, payment may be made for materials, prior to their use in the work, when satisfactory evidence is presented by the Contractor. Satisfactory evidence includes justification for the allowance (to expedite the work, meet project schedules, regional or national material shortages, etc.), documentation of material and transportation costs, and evidence that such material is properly stored on the project or at a secure location acceptable and accessible to the Department.

Material allowances will be considered only for nonperishable materials when the cost, including transportation, exceeds \$10,000 and such materials are not expected to be utilized within 60 days of the request for the allowance. For contracts valued under \$500,000, the minimum \$10,000 requirement may be met by combining the principal (material) product of no more than two contract items. An exception to this two item limitation may be considered for any contract regardless of value for items in which material (products) are similar except for type and/or size.

Material allowances shall not exceed the value of the contract items in which used and shall not include the cost of installation or related markups. Amounts paid by the Department for material allowances will be deducted from estimates due the Contractor as the material is used. Two-sided copies of the Contractor's cancelled checks for materials and transportation must be furnished to the Department within 60 days of payment of the allowances or the amounts will be reclaimed by the Department."

## **TRAFFIC CONTROL DEFICIENCY DEDUCTION (BDE)**

Effective: April 1, 1992

Revised: January 1, 2003

To ensure a prompt response to incidents involving the integrity of work zone traffic control, the Contractor shall provide a telephone number where a responsible individual can be contacted 24 hours-a-day.

When the Engineer is notified, or determines a traffic control deficiency exists, he/she will notify and direct the Contractor to correct the deficiency within a specified time. The specified time, which begins upon notification to the Contractor, will be from 1/2 hour to 12 hours based upon the urgency of the situation and the nature of the deficiency. The Engineer shall be the sole judge.

The deficiency may be any lack of repair, maintenance or non-compliance with the traffic control plan.

If the Contractor fails to correct the deficiency within the specified time, a daily monetary deduction will be imposed for each calendar day or fraction thereof the deficiency exists. The calendar day(s) will begin with notification to the Contractor and end with the Engineer's acceptance of the correction. The daily monetary deduction will be either \$1,000 or 0.05 percent of the awarded contract value, whichever is greater.

In addition, if the Contractor fails to respond, the Engineer may correct the deficiency and the cost thereof will be deducted from monies due or which may become due the Contractor. This corrective action will in no way relieve the Contractor of his/her contractual requirements or responsibilities.

## Weight Control Deficiency Deduction

Effective: April 1, 2001

Revised: August 1, 2002

The Contractor shall provide accurate weights of materials delivered to the contract for incorporation into the work (whether temporary or permanent) and for which the basis of payment is by weight. These weights shall be documented on delivery tickets which shall identify the source of the material, type of material, the date and time the material was loaded, the contract number, the net weight, the tare weight when applicable and the identification of the transporting vehicle. For aggregates, the Contractor shall have the driver of the vehicle furnish or establish an acceptable alternative to provide the contract number and a copy of the material order to the source for each load. The source is defined as that facility that produces the final material product that is to be incorporated into the contract pay items.

The Department will conduct random, independent vehicle weight checks for material sources according to the procedures outlined in the Documentation Section Policy Statement of the Department's Construction Manual and hereby incorporated by reference. The results of the independent weight checks shall be applicable to all contracts containing this Special Provision. Should the vehicle weight check for a source result in the net weight of material on the vehicle exceeding the net weight of material shown on the delivery ticket by 0.50% (0.70% for aggregates) or more, the Engineer will document the independent vehicle weight check and immediately furnish a copy of the results to the Contractor. No adjustment in pay quantity will be made. Should the vehicle weight check for a source result in the net weight of material shown on the delivery ticket exceeding the net weight of material on the vehicle by 0.50% (0.70% for aggregates) or more, the Engineer will document the independent vehicle weight check and immediately furnish a copy of the results to the Contractor. The Engineer will adjust the net weight shown on the delivery ticket to the checked delivered net weight as determined by the independent vehicle weight check.

The Engineer will also adjust the method of measurement for all contracts for subsequent deliveries of all materials from the source based on the independent weight check. The net weight of all materials delivered to all contracts containing this Special Provision from this source, for which the basis of payment is by weight, will be adjusted by applying a correction factor "A" as determined by the following formula:

$$A = 1.0 - \left( \frac{B - C}{B} \right); \text{ Where } A \leq 1.0; \left( \frac{B - C}{C} \right) > 0.50\% \text{ (0.70\% for aggregates)}$$

Where A = Adjustment factor  
B = Net weight shown on delivery ticket  
C = Net weight determined from independent weight check

The adjustment factor will be applied as follows:

$$\text{Adjusted Net Weight} = A \times \text{Delivery Ticket Net Weight}$$

The adjustment factor will be imposed until the cause of the deficient weight is identified and corrected by the Contractor to the satisfaction of the Engineer. If the cause of the deficient weight is not identified and corrected within seven (7) calendar days, the source shall cease delivery of all materials to all contracts containing this Special Provision for which the basis of payment is by weight.

Should the Contractor elect to challenge the results of the independent weight check, the Engineer will continue to document the weight of material for which the adjustment factor would be applied. However, provided the Contractor furnishes the Engineer with written documentation that the source scale has been calibrated within seven (7) calendar days after the date of the independent weight check, adjustments in the weight of material paid for will not be applied unless the scale calibration demonstrates that the source scale was not within the specified Department of Agriculture tolerance.

At the Contractor's option, the vehicle may be weighed on a second independent Department of Agriculture certified scale to verify the accuracy of the scale used for the independent weight check.



## **Erosion and Sediment Control Deficiency Deduction**

Effective: August 1, 2001

Revised: November 1, 2001

When the Engineer is notified or determines an erosion and/or sediment control deficiency(s) exists, he/she will direct the Contractor in writing to correct the deficiency. The Contractor shall then correct the deficiency within 24 hours. The deficiency may be any lack of repair, maintenance, or implementation of erosion and/or sediment control devices included in the contract, or any failure to comply with the conditions of the National Pollutant Discharge Elimination System (NPDES) Storm Water Permit for Construction Site Activities.

If the Contractor fails to correct the deficiency(s) within 24 hours, a daily monetary deduction will be imposed for each calendar day or fraction thereof the deficiency exists. The time period will begin with the initial written notification to the Contractor and end with the Engineer's acceptance of the corrected work. The per calendar day deduction will be either \$1000.00 or 0.05 percent of the awarded contract value, whichever is greater.

If the Contractor fails to respond, the Engineer may correct the deficiencies and deduct the cost from monies due or which may become due the Contractor. This corrective action shall in no way relieve the Contractor of his/her contractual requirements or responsibilities.

## **Inlet Filters**

Effective: August 1, 2003

Add the following to Article 280.02 of the Standard Specifications:

"(k) Inlet Filters..... 1081.15(h)"

Add the following paragraph after the first paragraph of Article 280.04(c) of the Standard Specifications:

"When specified, drainage structures shall be protected with inlet filters. Inlet filters shall be installed either directly on the drainage structure or under the grate of the drainage structure resting on the lip of the frame. The fabric bag shall hang down into the drainage structure. Prior to ordering materials, the Contractor shall determine the size and shape of the various drainage structures being protected."

Revise Article 280.07(d) of the Standard Specifications to read:

"(d) Inlet and Pipe Protection. This work will be paid for at the contract unit price per each for INLET AND PIPE PROTECTION.

Protection of drainage structures with inlet filters will be paid for at the contract unit price per each for INLET FILTERS."

Add the following to Article 1081.15 of the Standard Specifications:

"(h) Inlet Filters. An inlet filter shall consist of a steel frame with a two piece geotextile fabric bag attached with a stainless steel band and locking cap that is suspended from the frame. A clean, used bag and a used steel frame in good condition meeting the approval of the Engineer may be substituted for new materials. Materials for the inlet filter assembly shall conform to the following requirements:

(1) Frame Construction. Steel shall conform to Article 1006.04.

Frames designed to fit under a grate shall include an overflow feature that is welded to the frame's ring. The overflow feature shall be designed to allow full flow of water into the structure when the filter bag is full. The dimensions of the frame shall allow the drainage structure grate to fit into the inlet filter assembly frame opening. The assembly frame shall rest on the inside lip of the drainage structure frame for the full variety of existing and proposed drainage structure frames that are present on this contract. The inlet filter assembly frame shall not cause the drainage structure grate to extend higher than 6 mm (1/4 in.) above the drainage structure frame.

(2) Grate Lock. When the inlet is located in a traffic lane, a grate lock shall be used to secure the grate to the frame. The grate lock shall conform to the manufacturer's requirements for materials and installation.

(3) Geotextile Fabric Bag. The sediment bag shall be constructed of an inner filter bag and an outer reinforcement bag.

- a. Inner Filter Bag. The inner filter bag shall be constructed of a polypropylene geotextile fabric with a minimum silt and debris capacity of 0.06 cu m (2.0 cu ft). The bag shall conform to the following requirements:

Inner Filter Bag		
Material Property	Test Method	Minimum Avg. Roll Value
Grab Tensile Strength	ASTM D 4632	45 kg (100 lb)
Grab Tensile Elongation	ASTM D 4632	50%
Puncture Strength	ASTM D 4833	29 kg (65 lb)
Trapezoidal Tear	ASTM D 4533	20 kg (45 lb)
UV Resistance	ASTM D 4355	70% at 500 hours
Actual Open Size	ASTM D 1420	212 $\mu$ m (No. 70 sieve US)
Permittivity	ASTM D 4491	2.0/sec
Water Flow Rate	ASTM D 4491	5900 Lpm/sq m (145 gpm/sq ft)

- b. Outer Reinforcement Bag. The outer reinforcement bag shall be constructed of polyester mesh material that conforms to the following requirements:

Outer Reinforcement Bag		
Material Property	Test Method	Value
Content	ASTM D 629	Polyester
Weight	ASTM D 3776	155 g/sq m (4.55 oz/sq yd) $\pm$ 15%
Wholes (holes)	ASTM D 3887	7.5 $\pm$ 2 holes/25 mm (1 in.)
Chorses (holes)	ASTM D 3887	15.5 $\pm$ 2holes/25 mm (1 in.)
Instronball Burst	ASTM D 3887	830 kPa (120 psi) min.
Thickness	ASTM D 1777	1.0 $\pm$ 0.1 mm (0.040 $\pm$ 0.005 in.)

- (4) Certification. The manufacturer shall furnish a certification with each shipment of inlet filters, stating the amount of product furnished, and that the material complies with these requirements."

## **Subgrade Preparation**

Effective: November 1, 2002

Revise the tenth paragraph of Article 301.03 of the Standard Specifications to read:

"Equipment of such weight, or used in such a way as to cause a rut in the finished subgrade of 13 mm (1/2 in.) or more in depth, shall be removed from the work or the rutting otherwise prevented."

## **Superpave Bituminous Concrete Mixtures**

Effective: January 1, 2000

Revised: January 1, 2004

**Description.** This work shall consist of designing, producing and constructing Superpave bituminous concrete mixtures using Illinois Modified Strategic Highway Research Program (SHRP) Superpave criteria. This work shall be according to Sections 406 and 407 of the Standard Specifications and the special provision, "Quality Control/Quality Assurance of Bituminous Concrete Mixtures", except as follows.

### **Materials.**

- (a) **Fine Aggregate Blend Requirement.** The Contractor may be required to provide FA 20 manufactured sand to meet the design requirements. For mixtures with  $N_{design} \geq 90$ , at least 50 percent of the required fine aggregate fraction shall consist of either stone sand, slag sand, or steel slag sand meeting the FA/FM 20 gradation.
- (b) **Reclaimed Asphalt Pavement (RAP).** If the Contractor is allowed to use more than 15 percent RAP, as specified in the plans, a softer performance-graded binder may be required as determined by the Engineer.

RAP shall meet the requirements of the special provision, "RAP for Use in Bituminous Concrete Mixtures".

RAP will not be permitted in mixtures containing polymer modifiers.

RAP containing steel slag will be permitted for use in top-lift surface mixtures only.

- (c) **Bituminous Material.** The asphalt cement (AC) shall be performance-graded (PG) or polymer modified performance-graded (SBS-PG or SBR-PG) meeting the requirements of Article 1009.05 of the Standard Specifications for the grade specified on the plans.

The following additional guidelines shall be used if a polymer modified asphalt is specified:

- (1) The polymer modified asphalt cement shall be shipped, maintained, and stored at the mix plant according to the manufacturer's requirements. Polymer modified asphalt cement shall be placed in an empty tank and shall not be blended with other asphalt cements.
- (2) The mixture shall be designed using a mixing temperature of  $163 \pm 3^\circ\text{C}$  ( $325 \pm 5^\circ\text{F}$ ) and a gyratory compaction temperature of  $152 \pm 3^\circ\text{C}$  ( $305 \pm 5^\circ\text{F}$ ).
- (3) Pneumatic-tired rollers will not be allowed unless otherwise specified by the Engineer. A vibratory roller meeting the requirements of Article 406.16 of the Standard Specifications shall be required in the absence of the pneumatic-tired roller.

- (4) A manufacturer's representative from the polymer asphalt cement producer shall be present during each polymer mixture start-up and shall be available at all times during production and lay-down of the mix.

Laboratory Equipment.

- (a) Superpave Gyratory Compactor. The superpave gyratory compactor (SGC) shall be used for all QC/QA testing.
- (b) Ignition Oven. The ignition oven shall be used to determine the AC content. The ignition oven shall also be used to recover aggregates for all required washed gradations.

The Engineer may waive the ignition oven requirement for AC content if the aggregates to be used are known to have ignition AC content calibration factors which exceed 1.5 percent. If the ignition oven requirement is waived, other Department approved methods shall be used to determine the AC content.

Mixture Design. The Contractor shall submit mix designs, for approval, for each required mixture. Mix designs shall be developed by Level III personnel who have successfully completed the course, "Superpave Mix Design Upgrade". Articles 406.10 and 406.13 of the Standard Specifications shall not apply. The mixtures shall be designed according to the respective Illinois Modified AASHTO references listed below.

AASHTO MP 2	Standard Specification for Superpave Volumetric Mix Design
AASHTO PP 2	Standard Practice for Short and Long Term Aging of Hot Mix Asphalt (HMA)
AASHTO PP 19	Standard Practice for Volumetric Analysis of Compacted Hot Mix Asphalt (HMA)
AASHTO PP 28	Standard Practice for Designing Superpave HMA
AASHTO T 209	Theoretical Maximum Specific Gravity and Density of Bituminous Paving Mixtures
AASHTO T 312	Preparing and Determining the Density of Hot Mix Asphalt (HMA) Specimens by Means of the Superpave Gyratory Compactor
AASHTO T 308	Determining the Asphalt Content of Hot Mix Asphalt (HMA) by the Ignition Method

- (a) Mixture Composition. The ingredients of the bituminous mixture shall be combined in such proportions as to produce a mixture conforming to the composition limits by weight. The gradation mixture specified on the plans shall produce a mixture falling within the limits specified in Table 1.

TABLE 1. MIXTURE COMPOSITION (% PASSING) <sup>1/</sup>								
Sieve Size	IL-25.0 mm		IL-19.0 mm		IL-12.5 mm <sup>4/</sup>		IL-9.5 mm <sup>4/</sup>	
	min	max	min	max	min	max	min	max
37.5 mm (1 1/2 in.)		100						
25 mm (1 in.)	90	100		100				
19 mm (3/4 in.)		90	82	100		100		
12.5 mm (1/2 in.)	45	75	50	85	90	100		100
9.5 mm (3/8 in.)						90	90	100
4.75 mm (#4)	24	42 <sup>2/</sup>	24	50 <sup>2/</sup>	24	65	24	65
2.36 mm (#8)	16	31	16	36	16	48 <sup>3/</sup>	16	48 <sup>3/</sup>
1.18 mm (#16)	10	22	10	25	10	32	10	32
600 µm (#30)								
300 µm (#50)	4	12	4	12	4	15	4	15
150 µm (#100)	3	9	3	9	3	10	3	10
75 µm (#200)	3	6	3	6	4	6	4	6

- 1/ Based on percent of total aggregate weight.
- 2/ The mixture composition shall not exceed 40 percent passing the 4.75 mm (#4) sieve for binder courses with Ndesign ≥ 90.
- 3/ The mixture composition shall not exceed 40 percent passing the 2.36 mm (#8) sieve for surface courses with Ndesign ≥ 90.
- 4/ The mixture composition for surface courses shall be according to IL-12.5 mm or IL-9.5 mm, unless otherwise specified by the Engineer.

One of the above gradations shall be used for leveling binder as specified in the plans and according to Article 406.04 of the Standard Specifications.

It is recommended that the selected combined aggregate gradation not pass through the restricted zones specified in Illinois Modified AASHTO MP 2.

- (b) Dust/AC Ratio for Superpave. The ratio of material passing the 75 µm (#200) sieve to total asphalt cement shall not exceed 1.0 for mixture design (based on total weight of mixture).

- (c) **Volumetric Requirements.** The target value for the air voids of the hot mix asphalt (HMA) shall be 4.0 percent at the design number of gyrations. The VMA and VFA of the HMA design shall be based on the nominal maximum size of the aggregate in the mix and shall conform to the requirements listed in Table 2.

<b>TABLE 2. VOLUMETRIC REQUIREMENTS</b>					
	<b>Voids in the Mineral Aggregate (VMA), % minimum</b>				<b>Voids Filled with Asphalt (VFA), %</b>
<b>Ndesign</b>	<b>IL-25.0</b>	<b>IL-19.0</b>	<b>IL-12.5</b>	<b>IL-9.5</b>	
<b>50</b>	12.0	13.0	14.0	15	65 - 78
<b>70</b>					65 - 75
<b>90</b>					
<b>105</b>					

- (d) **Determination of Need for Anti-Stripping Additive.** The mixture designer shall determine if an additive is needed in the mix to prevent stripping. The determination will be made on the basis of tests performed according to Illinois Modified T 283 using 4 in. Marshall bricks. To be considered acceptable by the Department as a mixture not susceptible to stripping, the ratio of conditioned to unconditioned split tensile strengths (TSRs) shall be equal to or greater than 0.75. Mixtures, either with or without an additive, with TSRs less than 0.75 will be considered unacceptable.

If it is determined that an additive is required, the additive may be hydrated lime, slaked quicklime, or a liquid additive, at the Contractor's option. The liquid additive shall be selected from the Department's list of approved additives and may be limited to those which have exhibited satisfactory performance in similar mixes.

Dry hydrated lime shall be added at a rate of 1.0 to 1.5 percent by weight of total dry aggregate. Slurry shall be added in such quantity as to provide the required amount of hydrated lime solids by weight of total dry aggregate. The exact rate of application for all anti-stripping additives will be determined by the Department. The method of application shall be according to Article 406.12 of the Standard Specifications.

**Personnel.** The QC Manager and Level I Technician shall have successfully completed the Department's "Superpave Field Control Course".

**Required Plant Tests.** Testing shall be conducted to control the production of the bituminous mixture. The Contractor shall use the test methods identified to perform the following mixture tests at a frequency not less than that indicated in Table 3.



TABLE 3. REQUIRED PLANT TESTS for SUPERPAVE		
Parameter		Frequency of Tests
Asphalt Content by Ignition Oven		1 per half day of production
Air Voids	Bulk Specific Gravity of Gyratory Sample	1 per half day of production for first 2 days and 1 per day thereafter (first sample of the day)
	Maximum Specific Gravity of Mixture	
		Test Method
		Illinois Modified AASHTO T 308
		Illinois Modified AASHTO T 312
		Illinois Modified AASHTO T 209

During production, the ratio of minus 75  $\mu$ m (#200) sieve material to total asphalt cement shall be not less than 0.6 nor more than 1.2 and the moisture content of the mixture at discharge from the mixer shall not exceed 0.5 percent. If at any time the ratio of minus 75  $\mu$ m (#200) material to asphalt or moisture content of the mixture falls outside the stated limits, production of the mix shall cease. The cause shall be determined and corrective action satisfactory to the Engineer shall be initiated prior to resuming production.

During production, mixtures containing an anti-stripping additive will be tested by the Department for stripping according to Illinois Modified T 283. If the mixture fails to meet the TSR criteria for acceptance, no further mixture will be accepted until the Contractor takes such action as is necessary to furnish a mixture meeting the criteria.

#### Construction Requirements

##### Lift Thickness.

- (a) Binder and Surface Courses. The minimum compacted lift thickness for constructing bituminous concrete binder and surface courses shall be according to Table 4:

TABLE 4 – MINIMUM COMPACTED LIFT THICKNESS	
Mixture	Thickness, mm (in.)
IL-9.5	32 (1 1/4)
IL-12.5	38 (1 1/2)
IL-19.0	57 (2 1/4)
IL-25.0	76 (3)

- (b) Leveling Binder. Mixtures used for leveling binder shall be as follows:

TABLE 5 – LEVELING BINDER	
Nominal, Compacted, Leveling Binder Thickness, mm (in.)	Mixture
$\leq 32$ (1 1/4)	IL-9.5
32 (1 1/4) to 50 (2)	IL 9.5 or IL-12.5

Density requirements shall apply for leveling binder when the nominal, compacted thickness is 32 mm (1 1/4 in.) or greater for IL-9.5 mixtures and 38 mm (1 1/2 in.) or greater for IL-12.5 mixtures.

- (c) **Full-Depth Pavement.** The compacted thickness of the initial lift of binder course shall be 100 mm (4 in.). The compacted thickness of succeeding lifts shall meet the minimums specified in Table 4 but not exceed 100 mm (4 in.).

If a vibratory roller is used for breakdown, the compacted thickness of the binder lifts, excluding the top lift, may be increased to 150 mm (6 in.) provided the required density is obtained.

- (d) **Bituminous Patching.** The minimum compacted lift thickness for constructing bituminous patches shall be according to Table 4.

**Control Charts/Limits.** Control charts/limits shall be according to QC/QA Class I requirements, except density shall be plotted on the control charts within the following control limits:

<b>TABLE 6. DENSITY CONTROL LIMITS</b>	
<b>Parameter</b>	<b>Individual Test</b>
Ndesign $\geq$ 90	92.0 - 96.0%
Ndesign < 90	93 - 97%

**Basis of Payment.** On resurfacing projects, this work will be paid for at the contract unit price per metric ton (ton) for BITUMINOUS CONCRETE SURFACE COURSE, SUPERPAVE, of the friction aggregate mixture and Ndesign specified, LEVELING BINDER (HAND METHOD), SUPERPAVE, of the Ndesign specified, LEVELING BINDER (MACHINE METHOD), SUPERPAVE, of the Ndesign specified, and BITUMINOUS CONCRETE BINDER COURSE, SUPERPAVE, of the mixture composition and Ndesign specified.

On resurfacing projects in which polymer modifiers are required, this work will be paid for at the contract unit price per metric ton (ton) for POLYMERIZED BITUMINOUS CONCRETE SURFACE COURSE, SUPERPAVE, of the friction aggregate mixture and Ndesign specified, POLYMERIZED LEVELING BINDER (HAND METHOD), SUPERPAVE, of the Ndesign specified, POLYMERIZED LEVELING BINDER (MACHINE METHOD), SUPERPAVE, of the Ndesign specified, and POLYMERIZED BITUMINOUS CONCRETE BINDER COURSE, SUPERPAVE, of the mixture composition and Ndesign specified.

On full-depth pavement projects, this work will be paid for at the contract unit price per square meter (square yard) for BITUMINOUS CONCRETE PAVEMENT, (FULL-DEPTH), SUPERPAVE, of the thickness specified.

On projects where widening is constructed and the entire pavement is then resurfaced, the binder for the widening will be paid for at the contract unit price per square meter (square yard) for BITUMINOUS CONCRETE BINDER COURSE, SUPERPAVE, of the mixture composition, Ndesign, and thickness specified. The surface and binder used to resurface the entire pavement will be paid for according to the paragraphs above for resurfacing projects.

## RAP for Use in Bituminous Concrete Mixtures

Effective: January 1, 2000

Revised: April 1, 2002

Revise Article 1004.07 to read:

**"1004.07 RAP Materials.** RAP is reclaimed asphalt pavement resulting from cold milling or crushing of an existing dense graded hot-mix asphalt pavement. RAP must originate from routes or airfields under federal, state or local agency jurisdiction. The Contractor shall supply documentation that the RAP meets these requirements.

(a) Stockpiles. The Contractor shall construct individual, sealed RAP stockpiles meeting one of the following definitions. No additional RAP will be allowed on top of the pile after the pile has been sealed.

(1) Homogeneous. Homogeneous RAP stockpiles shall consist of RAP from Class I/ Superpave, or equivalent mixtures only and represent the same aggregate quality, but shall be at least C quality or better, the same type of crushed aggregate (either crushed natural aggregate, ACBF slag, or steel slag), similar gradation and similar AC content. If approved by the Engineer, combined single pass surface/binder millings may be considered "homogenous", with a quality rating dictated by the lowest coarse aggregate quality present in the mixture. Homogenous stockpiles shall meet the requirements of Article 1004.07(d). Homogeneous RAP stockpiles not meeting these requirements may be processed (crushing and screening) and retested.

(2) Conglomerate. Conglomerate RAP stockpiles shall consist of RAP from Class I/ Superpave, or equivalent mixtures only. The coarse aggregate in this RAP shall be crushed aggregate only and may represent more than one aggregate type and/or quality but shall be at least C quality or better. This RAP may have an inconsistent gradation and/or asphalt cement content prior to processing. All conglomerate RAP shall be processed prior to testing by crushing to where all RAP shall pass the 16 mm (5/8 in.) or smaller screen. Conglomerate RAP stockpiles shall not contain steel slag or other expansive material as determined by the Department. Conglomerate RAP stockpiles shall meet the requirements of Article 1004.07(d).

(3) Conglomerate "D" Quality (DQ). Conglomerate DQ RAP stockpiles shall consist of RAP containing coarse aggregate (crushed or round) that is at least D quality or better. This RAP may have an inconsistent gradation and/or asphalt content. Conglomerate DQ RAP stockpiles shall not contain steel slag or other expansive material as determined by the Department. Conglomerate DQ RAP shall meet the requirements of Article 1004.07(d).

Reclaimed Superpave Low ESAL IL-9.5L surface mixtures shall only be placed in conglomerate DQ RAP stockpiles due to the potential for rounded aggregate.

(4) Other. RAP stockpiles that do not meet the requirements of the stockpile categories listed above shall be classified as "Other". "Other" RAP stockpiles shall not be used in any of the Department's bituminous mixtures.

- (b) Use. The allowable use of a RAP stockpile shall be set by the lowest quality of coarse aggregate in the RAP stockpile. Class I/Superpave surface mixtures are designated as containing Class B quality coarse aggregate only. Superpave Low ESAL IL-19.0L binder and IL-9.5L surface mixtures are designated as Class C quality coarse aggregate only. Class I/Superpave binder mixtures, bituminous base course mixtures, and bituminous base course widening mixtures are designated as containing Class C quality coarse aggregate only. Bituminous stabilized subbase and BAM shoulders are designated as containing Class D quality coarse aggregate only. Any mixture not listed above shall have the designated quality determined by the Department.

RAP containing steel slag or other expansive material, as determined by the Department, shall be homogeneous and will be approved for use in Class I/Superpave (including Low ESAL) surface mixtures only. RAP stockpiles for use in Class I/Superpave mixtures (including Low ESAL), base course, base course widening and Class B mixtures shall be either homogeneous or conglomerate RAP stockpiles except conglomerate RAP stockpiles shall not be used in Superpave surface mixture Ndesign 50 or greater. RAP for use in bituminous aggregate mixtures (BAM) shoulders and BAM stabilized subbase shall be from homogeneous, conglomerate, or conglomerate DQ stockpiles.

Additionally, RAP used in Class I/Superpave surface mixtures shall originate from milled or crushed mixtures only, in which the coarse aggregate is of Class B quality or better. RAP stockpiles for use in Class I/Superpave (including Low ESAL) binder mixes as well as base course, base course widening and Class B mixtures shall originate from milled or processed surface mixture, binder mixture, or a combination of both mixtures uniformly blended to the satisfaction of the Engineer, in which the coarse aggregate is of Class C quality or better.

- (c) Contaminants. RAP containing contaminants, such as earth, brick, sand, concrete, sheet asphalt, bituminous surface treatment (i.e. chip seal), pavement fabric, etc., will be unacceptable unless the contaminants are removed to the satisfaction of the Engineer. Sheet asphalt shall be stockpiled separately.
- (d) Testing. All RAP shall be sampled and tested either during or after stockpiling.

For testing during stockpiling, washed extraction samples shall be run at the minimum frequency of one sample per 450 metric tons (500 tons) for the first 1800 metric tons (2,000 tons) and one sample per 1800 metric tons (2,000 tons) thereafter. A minimum of five tests shall be required for stockpiles less than 3600 metric tons (4,000 tons).

For testing existing stockpiles, the Contractor shall submit a plan for approval to the District proposing a satisfactory method of sampling and testing the RAP pile either in-situ or by restockpiling. The sampling plan shall meet the minimum frequency required above and detail the procedure used to extract representative samples throughout the pile for testing.

Before extraction, each field sample shall be split to test sample size. One of the two test samples from the final split shall be labeled and stored for Department use. The Contractor shall extract the other test sample according to Department procedure. The Engineer reserves the right to test any sample (split or Department-taken) to verify Contractor test results.

All of the extraction results shall be compiled and averaged for asphalt content and gradation. Individual extraction test results, when compared to the averages, will be accepted if within the tolerances listed below.

Parameter	Homogeneous / Conglomerate	Conglomerate "D" Quality
25 mm (1 in.)		± 5%
12.5 mm (1/2 in.)	± 8%	± 15%
4.75 mm (No. 4)	± 6%	± 13%
2.36 mm (No. 8)	± 5%	
1.18 mm (No. 16)		± 15%
600 µm (No. 30)	± 5%	
75 µm (No. 200)	± 2.0%	± 4.0%
AC	± 0.4%	± 0.5%

If more than 20 percent of the individual sieves are out of the gradation tolerances, or if more than 20 percent of the asphalt content test results fall outside the appropriate tolerances, the RAP will not be allowed to be used in the Department's bituminous concrete mixtures unless the RAP representing the failing tests is removed from the stockpile to the satisfaction of the Engineer. All test data and acceptance ranges shall be sent to the District for evaluation.

With the approval of the Engineer, the ignition oven may be substituted for extractions according to the Illinois Test Procedure, "Calibration of the Ignition Oven for the Purpose of Characterizing Reclaimed Asphalt Pavement (RAP)".

- (e) Designs. At the Contractor's option, bituminous concrete mixtures may be constructed utilizing RAP material meeting the above detailed requirements. The amount of RAP included in the mixture shall not exceed the percentages specified in the plans.

RAP designs shall be submitted for volumetric verification. If additional RAP stockpiles are tested and found that no more than 20 percent of the results, as defined under "Testing" herein, are outside of the control tolerances set for the original RAP stockpile and design, and meets all of the requirements herein, the additional RAP stockpiles may be used in the original mix design at the percent previously verified.

- (f) Production. The coarse aggregate in all RAP used shall be equal to or less than the nominal maximum size requirement for the bituminous mixture being produced.

To remove or reduce agglomerated material, a scalping screen, crushing unit or comparable sizing device approved by the Engineer shall be used in the RAP feed system to remove or reduce oversized material. If material passing the sizing device adversely affects the mix production or quality of the mix, the sizing device shall be set at a size specified by the Engineer.

If the RAP control tolerances or QC/QA test results require corrective action, the Contractor shall cease production of the mixture containing RAP and either switch to the virgin aggregate design or submit a new RAP design.

## Bituminous Concrete Surface Course

Effective: April 1, 2001

Revised: April 1, 2003

Replace the fourth paragraph of Article 406.23(b) of the Standard Specifications with the following:

"Mixture for cracks, joints, flangeways, leveling binder (machine method), leveling binder (hand method) and binder course in excess of 103 percent of the quantity specified by the Engineer will not be measured for payment.

Surface course mixture in excess of 103 percent of adjusted plan quantity will not be measured for payment. The adjusted plan quantity for surface course mixtures will be calculated as follows:

Adjusted Plan Quantity = C x quantity shown on the plans or as specified by the Engineer.

where C =      metric:  $C = \frac{G_{mb} \times 24.99}{U}$       English:  $C = \frac{G_{mb} \times 46.8}{U}$

and where:

$G_{mb}$  = average bulk specific gravity from approved mix design.

$U$  = Unit weight of surface course shown on the plans in kg/sq m/25 mm (lb/sq yd/in.), used to estimate plan quantity.

24.99 = metric constant.

46.8 = English constant.

If project circumstances warrant a new surface course mix design, the above equations shall be used to calculate the adjusted plan quantity for each mix design using its respective average bulk specific gravity."

## Coarse Aggregate for Trench Backfill, Backfill and Bedding

Effective: April 1, 2001  
Revised: November 1, 2003

Revise Article 208.02 of the Standard Specifications to read:

**"208.02 Materials.** Materials shall be according to the following Articles of Section 1000 – Materials:

- (a) Fine Aggregate (Note 1).....1003.04
- (b) Coarse Aggregate (Note 2) .....1004.06

Note 1. The fine aggregate shall be moist to the satisfaction of the Engineer.

Note 2. The coarse aggregate shall be wet to the satisfaction of the Engineer."

Revise the first sentence of the second paragraph of subparagraph (b) in Article 208.03 of the Standard Specifications to read:

"Any material meeting the requirements of Articles 1003.04 or 1004.06 which has been excavated from the trenches shall be used for backfilling the trenches."

Add the following to the end of Article 542.02 of the Standard Specifications:

- "(bb) Fine Aggregate (Note 1).....1003.04
- (cc) Coarse Aggregate (Note 2) .....1004.06

Note 1. The fine aggregate shall be moist to the satisfaction of the Engineer.

Note 2. The coarse aggregate shall be wet to the satisfaction of the Engineer."

Revise the first and second sentences of the second paragraph of subparagraph (a) of Article 542.04 of the Standard Specifications to read:

"The unstable and unsuitable material shall be removed to a depth determined by the Engineer and for a width of one diameter (or equivalent diameter) of the pipe on each side of the pipe culvert, and replaced with aggregate. Rock shall be removed to an elevation 300 mm (1 ft) lower than the bottom of the pipe or to a depth equal to 40 mm/m (1/2 in./ft) of ultimate fill height over the top of the pipe culvert, whichever is the greater depth, and for a width as specified in (b) below, and replaced with aggregate."

Revise the second paragraph of subparagraph (c) of Article 542.04 of the Standard Specifications to read:

"Well compacted aggregate, at least 100 mm (4 in.) in depth below the pipe culvert, shall be placed the entire width of the trench and for the length of the pipe culvert, except well compacted impervious material shall be used for the outer 1 m (3 ft) at each end of the pipe."

When the trench has been widened by the removal and replacement of unstable or unsuitable material, the foundation material shall be placed for a width not less than the above specified widths on each side of the pipe. The aggregate and impervious material shall be approved by the Engineer and shall be compacted to the Engineer's satisfaction by mechanical means."

Revise subparagraph (e) of Article 542.04 of the Standard Specifications to read:

"(e) Backfilling. As soon as the condition of the pipe culvert will permit, the entire width of the trench shall be backfilled with aggregate to a height of at least the elevation of the center of the pipe. The aggregate shall be placed longitudinally along the pipe culvert, except at the outer 1 m (3 ft) at each end of the culvert which shall be backfilled with impervious material. The elevation of the backfill material on each side of the pipe shall be the same. The space under the pipe shall be completely filled. The aggregate and impervious material shall be placed in 200 mm (8 in.) layers, loose measurement. When using PVC, PE, or corrugated metal pipe, the aggregate shall be continued to a height of at least 300 mm (1 ft) above the top of the pipe and compacted to a minimum of 85 percent of standard lab density by mechanical means. When reinforced concrete pipes are used and the trench is within 600 mm (2 ft) of the pavement structure, the backfill shall be compacted to a minimum of 85 percent of standard lab density by mechanical means.

When using PVC, PE, or corrugated metal pipe a minimum of 300 mm (1 ft) of cover from the top of the pipe to the top of the subgrade will be required.

The installed pipe and its embedment shall not be disturbed when using movable trench boxes and shields, sheet pile, or other trench protection.

The remainder of the trench shall be backfilled with select material, from excavation or borrow, free from large or frozen lumps, clods or rock, meeting the approval of the Engineer. The material shall be placed in layers not exceeding 200 mm (8 in.) in depth, loose measurement and compacted to 95 percent of the standard laboratory density. Compaction shall be obtained by use of mechanical tampers or with approved vibratory compactors. Before compacting, each layer shall be wetted or dried to bring the moisture content within the limits of 80 to 110 percent of optimum moisture content determined according to AASHTO T 99 (Method C). All backfill material shall be deposited in the trench or excavation in such a manner as not to damage the culvert. The filling of the trench shall be carried on simultaneously on both sides of the pipe. The Contractor may, at his/her expense, backfill the entire trench with aggregate in lieu of select material. The aggregate shall be compacted to the satisfaction of the Engineer by mechanical means.

The backfill material for all trenches and excavations made in the subgrade of the proposed improvement, and for all trenches outside of the subgrade where the inner edge of the trench is within 600 mm (2 ft) of the edge of the proposed pavement, curb, gutter, curb and gutter, stabilized shoulder, or sidewalk shall be according to Section 208. The trench backfill material shall be compacted to a minimum of 85 percent of standard lab density by mechanical means.

The Contractor may, at his/her expense, backfill the entire trench with controlled low strength material meeting the approval of the Engineer.

When the trench has been widened for the removal and replacement of unstable or unsuitable material, the backfilling with aggregate and impervious material, will be required for a width of at least the specified widths on each side of the pipe. The remaining width of each layer may be



backfilled with select material. Each 200 mm (8 in.) layer for the entire trench width shall be completed before beginning the placement of the next layer."

Revise subparagraph (b) of Article 542.05 of the Standard Specifications to read:

"(b) Embankment. Embankment extending to an elevation of 300 mm (1 ft) over the top of the pipe shall be constructed according to Article 542.04(f), except the material up to the elevation of the center of the pipe and extending to a width of at least 450 mm (18 in.) on each side of the pipe, exclusive of the outer 1 m (3 ft) at each end of the pipe, shall consist of aggregate. At the outer 1 m (3 ft) at each end of the culvert, impervious material shall be used."

Add the following paragraph after the first paragraph of Article 542.10 of the Standard Specifications:

"Trench backfill will be measured for payment according to Article 208.03."

Add the following paragraph after the third paragraph of Article 542.11 of the Standard Specifications:

"Trench backfill will be paid for according to Article 208.04."

Add the following to of Article 550.02 of the Standard Specifications:

"(m) Fine Aggregate (Note 2).....	1003.04
(n) Coarse Aggregate (Note 3) .....	1004.06

Note 2. The fine aggregate shall be moist to the satisfaction of the Engineer.

Note 3. The coarse aggregate shall be wet to the satisfaction of the Engineer."

Revise the first two sentences of the third paragraph of Article 550.04 of the Standard Specifications to read:

"Well compacted, aggregate bedding material at least 100 mm (4 in.) in depth below the pipe, shall be placed for the entire width of the trench and length of the pipe. The aggregate shall be compacted to the satisfaction of the Engineer by mechanical means."

Revise Article 550.07 of the Standard Specifications to read:

**"550.07 Backfilling.** As soon as the condition of the pipe will permit, the entire width of the trench shall be backfilled with aggregate to a height of at least the elevation of the center of the pipe. The aggregate shall be placed longitudinally along the pipe. The elevation of the backfill material on each side of the pipe shall be the same. The space under the pipe shall be completely filled. The aggregate backfill material shall be placed in 200 mm (8 in.) layers, loose measurement and compacted to the satisfaction of the Engineer by mechanical means. When using PVC pipe, the aggregate shall be continued to a height of at least 300 mm (12 in.) above the top of the pipe.

The installed pipe and its embedment shall not be disturbed when using movable trench boxes and shields, sheet pile, or other trench protection.

The remainder of the trench and excavation shall be backfilled to the natural line or finished surface as rapidly as the condition of the sewer will permit. The backfill material shall consist of suitable excavated material from the trench or of trench backfill as herein specified. All backfill material shall be deposited in the trench or excavation in such a manner as not to damage the sewer and shall be compacted to the satisfaction of the Engineer by mechanical means. The filling of the trench shall be carried on simultaneously on both sides of the pipe.

The backfill material for trenches and excavation made in the subgrade of the proposed improvement, and for all trenches outside of the subgrade where the inner edge of the trench is within 600 mm (2 ft) of the edge of the proposed pavement, curb, gutter, curb and gutter, stabilized shoulder or sidewalk shall be according to Section 208. The backfill material shall be compacted to 85 percent of standard lab density by mechanical means.

All backfill material up to a height of 300 mm (1 ft) above the pipe shall be deposited in uniform layers not exceeding 200 mm (8 in.) thick, loose measurement. The material in each layer shall be compacted to the satisfaction of the Engineer by mechanical means. The backfilling above this height shall be done according to Method 1, 2 or 3 as described below, with the following exceptions.

When trench backfill or excavated material meeting the requirements of Section 208 is required above the first 300 mm (1 ft) of the pipe, the layers shall not exceed 200 mm (8 in.). Gradations CA6 or CA10 shall not be used with Method 2 or Method 3.

Method 1. The material shall be deposited in uniform layers not exceeding 300 mm (1 ft) thick, loose measurement, and each layer shall be compacted to the satisfaction of the Engineer by mechanical means.

Method 2. The material shall be deposited in uniform layers not exceeding 300 mm (1 ft) thick, loose measurement, and each layer shall be either inundated or deposited in water.

Method 3. The trench shall be backfilled with loose material, and settlement secured by introducing water through holes jetted into the backfill to a point approximately 600 mm (2 ft) above the top of the pipe. The holes shall be spaced as directed by the Engineer but shall be no farther than 2 m (6 ft) apart.

The water shall be injected at a pressure just sufficient to sink the holes at a moderate rate of speed. The pressure shall be such that the water will not cut cavities in the backfill material nor overflow the surface. If water does overflow the surface, it shall be drained into the jetted holes by means of shallow trenches.

Water shall be injected as long as it will be absorbed by the backfill material and until samples taken from test holes in the trench show a satisfactory moisture content. The Contractor shall bore the test holes not more than 15 m (50 ft) apart and at such other locations in the trench designated by the Engineer. As soon as the watersoaking has been completed, all holes shall be filled with soil and compacted by ramming with a tool approved by the Engineer.

Backfill material which has been watersoaked shall be allowed to settle and dry for at least 10 days before any surface course or pavement is constructed on it. The length of time may be altered, if deemed desirable, by the Engineer. Where the inner edge of the trench is within 600 mm (2 ft) of the

edge of the proposed pavement, curb, gutter, curb and gutter, stabilized shoulder or sidewalk, the provisions of this paragraph shall also apply.

At the end of the settling and drying period, the crusted top of the backfill material shall be scarified and, if necessary, sufficient backfill material added, as specified in Method 1, to complete the backfilling operations.

The method used for backfilling and compacting the backfill material shall be the choice of the Contractor. If the method used does not produce results satisfactory to the Engineer, the Contractor will be required to alter or change the method being used so the resultant backfill will be satisfactory to the Engineer. Should the Contractor be required to alter or change the method being used, no additional compensation will be allowed for altering or changing the method.

The Contractor may, at his/her expense, backfill the entire trench with controlled low strength material meeting the approval of the Engineer.

When sheeting and bracing have been used, sufficient bracing shall be left across the trench as the backfilling progresses to hold the sides firmly in place without caving or settlement. This bracing shall be removed as soon as practicable. Any depressions which may develop within the area involved in the construction operation due to settlement of the backfilling material shall be filled in a manner approved by the Engineer.

When the Contractor constructs the trench with sloped or benched sides according to Article 550.04, backfilling for the full width of the excavation shall be as specified, except no additional compensation will be allowed for trench backfill material required outside the vertical limits of the specified trench width.

Whenever excavation is made for installing sewer pipe across earth shoulders or private property, the topsoil disturbed by excavation operations shall be replaced as nearly as possible in its original position, and the whole area involved in the construction operations shall be left in a neat and presentable condition.

When using any PVC pipe, the pipe shall be backfilled with aggregate to 300 mm (1 ft) over the top of the pipe and compacted to a minimum of 85 percent of standard lab density by mechanical means.

When reinforced concrete pipes are used and the trench is within 600 mm (2 ft) of the pavement structure, the backfill shall be compacted to a minimum of 85 percent of standard lab density by mechanical means.

Deflection Testing for Storm Sewers. All PVC storm sewers will be tested for deflection not less than 30 days after the pipe is installed and the backfill compacted.

For PVC storm sewers with diameters 600 mm (24 in.) or smaller, a mandrel drag shall be used for deflection testing. For PVC storm sewers with diameters over 600 mm (24 in.), deflection measurements other than by a mandrel drag shall be used.

Where the mandrel is used, the mandrel shall be furnished by the Contractor and pulled by hand through the pipeline with a suitable rope or cable connected to each end. Winching or other means of forcing the deflection gauge through the pipeline will not be allowed.

The mandrel shall be of a shape similar to that of a true circle enabling the gauge to pass through a satisfactory pipeline with little or no resistance. The mandrel shall be of a design to prevent it from

tipping from side to side and to prevent debris build-up from occurring between the channels of the adjacent fins or legs during operation. Each end of the core of the mandrel shall have fasteners to which the pulling cables can be attached. The mandrel shall have 9, various sized fins or legs of appropriate dimension for various diameter pipes. Each fin or leg shall have a permanent marking that states its designated pipe size and percent of deflection allowable.

The outside diameter of the mandrel shall be 95 percent of the base inside diameter, where the base inside diameter is:

For all PVC pipe (as defined using ASTM D 3034 methodology):

If the pipe is found to have a deflection greater than specified, that pipe section shall be removed, replaced, and retested."

Revise subparagraph (c) of Article 1003.04 of the Standard Specifications to read:

"(c) Gradation. The fine aggregate gradation shall be as follows:

Backfill, bedding and trench backfill for pipe	
culverts and storm sewers .....	FA 1, FA 2, FA 6, or FA 21
Porous granular embankment and backfill, french drains,	
and sand backfill for underdrains .....	FA 1, FA 2, or FA20 (Note 1)

Note 1: For FA 1, FA 2, and FA 20 the percent passing the 75  $\mu$ m (No. 200) sieve shall be  $2 \pm 2$ ."

Revise the title of Article 1004.06 of the Standard Specifications to read:

**"Coarse Aggregate for Blotter, Embankment, Backfill, Trench Backfill, French Drains, and Bedding."**

Add the following to the end of subparagraph (c) of Article 1004.06 of the Standard Specifications:

"Backfill, bedding, and trench backfill for pipe culverts	
and storm sewers .....	CA 6, CA 10, and CA 18"

## **Expansion Joints**

Effective: August 1, 2003

Add the following paragraph after the second paragraph of Article 420.10(e) of the Standard Specifications:

"After the dowel bars are oiled, plastic expansion caps shall be secured to the bars maintaining a minimum expansion gap of 50 mm (2 in.) between the end of the bar and the end of the cap. The caps shall fit snugly on the bar and the closed end shall be watertight. For expansion joints formed using dowel bar basket assemblies, the caps shall be installed on the alternating free ends of the bars. For expansion joints formed using a construction header, the caps shall be installed on the exposed end of each bar once the header has been removed and the joint filler material has been installed."

## Curb Ramps for Sidewalk

Effective: January 1, 2004

**Description.** This work shall consist of constructing sidewalk curb ramps with detectable warnings in compliance with the Americans with Disabilities Act, Accessibility Guidelines (ADAAG). Work shall be according to Section 424 of the Standard Specifications except as modified herein.

The detectable warnings shall consist of an area of truncated domes that provide both visual and tactile cues to pedestrians who are about to enter into traffic. The warning area shall begin 150 mm (6 in.) from the back of the curb and continue 600 mm (2 ft) in the direction of pedestrian travel for the entire width of the walking surface.

The detectable warnings shall also present a contrast in color from the adjacent sidewalk. This shall be accomplished by constructing the warning area, plus the 150 mm (6 in.) area between the warning area and the back of curb, out of concrete that is integrally colored red. However if the sidewalk is brick or of some dark color, the contrast requirement shall be achieved with normal (grey), Class SI concrete.

**Materials.** Materials for the detectable warning area of the curb ramps shall meet the following requirements.

- a) **Integrally Colored Concrete.** Integrally colored concrete shall be according to Section 1020 of the Standard Specification for Class SI concrete except as follows.

- |                    |   |
|--------------------|---|
| Article 1020.04    | The allowable water/cement ratio range shall be 0.40 minimum to 0.44 maximum.   |
| Article 1020.04    | The allowable slump range shall be 75 mm (3 in.) minimum to 125 mm (5 in.) maximum.   |
| Article 1020.04    | The allowable coarse aggregate gradations shall be CA 11, CA 13, CA 14, and CA 16.  |
| Article 1020.05(b) | A calcium chloride accelerating admixture shall not be used.  |
| Article 1020.05(b) | The cement factor shall not be reduced if a water-reducing or high range water-reducing admixture is used.                            |
| Article 1020.05(c) | Fly ash shall not be used.  |
| Article 1020.05(k) | Ground granulated blast-furnace slag shall not be used.   |
| Article 1020.11    | Pigment for integrally colored concrete shall be added to the concrete and mixed per the Manufacturer's recommendation.               |
| Article 1020.13    | The curing method shall be Type I membrane curing.  |
| Article 1020.13.   | The protection method shall be according to Article 1020.13(e)(1) and the protection period shall be 96 hours. No material, including |

the insulating material, shall be placed in direct contact with the concrete surface.

- (b) Pigment for Integrally Colored Concrete. The pigment shall meet the requirements of ASTM C 979, match color number 30166 of Federal Standard 595, and be on the Department's Approved List of Pigments for Integrally Colored Concrete.
- (c) Release Agent for Concrete Stamping Tools. The release agent shall be according to the stamping tool manufacturer's recommendations and the following: it shall be a clear liquid that will evaporate, it shall not harm the concrete, and it shall allow the application of Type I membrane curing.

Equipment. Equipment for the detectable warning area of the curb ramps shall meet the following requirements.

- (a) Concrete Stamps. Sufficient numbers and sizes of stamps shall be furnished to cover the various widths of the curb ramps. The stamps shall have an air opening at the top of each truncated dome recess; and shall be rigid enough to evenly distribute the force exerted during tamping.
- (b) Tamper. The tamper shall be according to the concrete stamp manufacturer's recommendations.

#### CONSTRUCTION REQUIREMENTS

Stamping. The concrete shall be placed and finished according to Article 424.06 except the area to be stamped shall not be brushed. When the bleed water has been absorbed, stamping shall begin. The entire width of the curb ramp shall be stamped at the same time. A single stamp or a combination of stamps may be used.

Prior to placing the stamp on the concrete, the stamp shall be coated with the release agent. When recommended by the manufacturer, the release agent shall also be applied to the concrete surface. Once the stamp has been placed on the ramp, it shall remain down until the stamping is complete.

The entire area of the stamp shall be tamped with a short, slow, repetitive action such that the concrete is caused to move up and into the dome recesses of the stamp. Tamping shall continue until mortar has come through the air openings in the stamp. Stepping or walking on the stamp will not be allowed. The base elevation of the domes shall be even with the adjacent sidewalk surface; the stamp shall not be forced down into the concrete.

When stamping is complete, the stamp shall be removed and the concrete cured.

Upon completion of curing, or after cold weather protection if required, the protruding mortar tip on the top of each dome shall be removed and the dome rubbed or ground smooth.

## **Asbestos Waterproofing Membrane and Asbestos Bituminous Concrete Surface Removal**

Effective June 1, 1989  
Revised June 30, 1994

This item shall consist of furnishing all labor and equipment for the removal and disposal of the existing variable thickness bituminous concrete surface and all of the asbestos waterproofing membrane system from the bridge deck area or variable thickness bituminous concrete surface containing asbestos shown on the plans, in accordance with the requirements of Section 440 of the Standard Specifications, and the following.

Complete surface removal is required for the entire deck including the waterproofing membrane system, the removal shall be done in such a manner that the concrete deck or the concrete beams are not damaged.

The Contractor is advised that the waterproofing membrane system or bituminous concrete wearing contains asbestos. Therefore, he shall take all necessary precautions in removing, handling, transporting and subsequent disposal of all materials removed containing asbestos. All such work shall be in conformance with all governing laws, codes, ordinances or other regulations.

The asbestos membrane, if present, shall be wet saw-cut and removed.

Grinding or roto-milling the existing wearing surface or the membrane system will not be allowed.

All removed material containing asbestos shall be stockpiled separately from other removed material.

All stockpiled material containing asbestos shall be hauled to an approved landfill disposal site. This removed material shall be wetted down in the truck and shall be covered with an approved wetting material to prevent debris or dust from entering into the atmosphere.

The Resident Engineer shall keep records of removal, stockpiling, trucking and the landfill disposal site used.

This work, as herein specified, will be paid for at the contract unit price per square yard for BITUMINOUS CONCRETE SURFACE REMOVAL (ASBESTOS), which price shall include removal of all asbestos waterproofing membrane system.



## Precast Concrete

Effective: July 1, 1999

Revised: January 1, 2002

**Description.** This special provision identifies non-prestressed, precast concrete products which shall be produced according to the Department's current, "Quality Control/Quality Assurance Program for Precast Concrete Products".

**Products.** The list of products is as follows:

Product Class	Precast Item
Box Culvert	Precast Concrete Box Culverts
Pipe	Reinforced Concrete Culvert, Storm Drain and Sewer Pipe
	Concrete Sewer, Storm Drain and Culvert Pipe
	Reinforced Concrete Elliptical Culvert, Storm Drain and Sewer Pipe
	Concrete Drain Tile
	Reinforced Concrete Arch Culvert, Storm Drain and Sewer Pipe
	Concrete Headwall for Pipe Drains
	Precast Reinforced Concrete Flared End Sections and Elliptical Flared End Sections
	Precast Reinforced Concrete Pipe Elbows, Tees and Collars
Structure	Precast Concrete Members
Block/Brick	Erosion Control: Concrete Block Riprap, Block Revetment Mat, and Articulated Block Mat
	Concrete Building Brick
	Concrete Masonry Units
Drainage Structure	Precast Reinforced Concrete Catch Basins, Manholes, Inlets, Miscellaneous Structures, Valve Vaults and Flat Slab Tops/Bottoms
Barrier	Concrete Barrier
	Temporary Concrete Barrier
Miscellaneous	Right of Way, Drainage, Section and Permanent Survey Markers, Bumper Blocks, Junction Boxes, and Handholes

For precast concrete products which are constructed according to AASHTO M 86, M 170, M 178, M 199, M 206, M 207, M 259, or M 273; portland or blended hydraulic cement shall be according to Article 1001.01 of the Standard Specifications, except the pozzolan constituent in the Type IP or Type I (PM) cement shall be fly ash. In addition, the minimum or maximum combination of a portland cement and a cementitious material shall be according to the AASHTO M specification. The cementitious material shall be according to Articles 1010.01, 1010.03, 1014.01, 1014.02, 1015.01, 1015.02, 1016.01 and 1016.02.

**Acceptance.** Products which have been lot or piece inspected and approved by the Department prior to July 1, 1999, will be accepted for use on this contract. Products produced on or after July 1, 1999, will be accepted only if produced according to the Department's current "Quality Control/Quality Assurance Program for Precast Concrete Products".

## Adjusting Frames and Grates

Effective: August 1, 2001

Revised: November 1, 2001

Add the following to Article 602.02 of the Standard Specifications:

- "(k) High Density Polyethylene (HDPE) Plastic .....Note 2  
(l) Recycled Rubber .....Note 3

Note 2. HDPE plastic adjusting rings may be used to adjust the frames and grates of drainage and utility structures up to a maximum of 75 mm (3 in.). They shall be installed and sealed underneath the frames according to the manufacturer's specifications.

HDPE plastic adjusting rings shall be manufactured from Class B HDPE plastic, as identified in ASTM D 1248, using the injection molding process. They shall be designed and tested to meet or exceed an HS25 wheel load according to the AASHTO Standard Specifications for Highway Bridges and shall be stabilized against the effects of ultra violet light.

Recycled material may be used. If recycled material is used, only polyethylene and less than two percent polypropylene will be allowed in the reclaim process. All feed stock shall be tested by the manufacturer on a procurement/production batch basis to verify the following property values:

Physical Property	Test Standard	Value
Melt Flow Index	ASTM D 1238	0.30 to 30.0 g/10 min (0.01 to 1.06 oz/10 min)
Specific Gravity	ASTM D 792	0.84 to 0.98
Tensile Strength, Yield	ASTM D 638	13,800 kPa (2000 psi) minimum

HDPE plastic adjusting rings shall have no void areas, cracks, or tears, and have no effects due to exposure to ultraviolet light. Ripples or sags are limited to less than ten percent of the surface. The actual diameter or length shall not vary more than 3 mm (0.125 in.) from the specified diameter or length. Variations in height are limited to  $\pm 1.6$  mm (0.063 in.) for parts up to 50 mm (2 in.) or  $\pm 3$  mm (0.125 in.) for parts from 50 mm (2 in.) to 75 mm (3 in.). Variations shall not exceed 6 mm (0.25 in.) from flat (dish, bow or convoluting edge) or 3 mm (0.125 in.) for bulges or dips in the surface.

Note 3. Riser rings fabricated from recycled rubber may be used to adjust the frames and grates of drainage and utility structures up to a maximum of 50 mm (2 in.). They shall be installed and sealed underneath the frames according to the manufacturer's specifications.

Recycled rubber products shall consist of no less than 80 percent by weight recycled rubber. The riser shall meet or exceed the following when maintained at  $23 \pm 2^\circ\text{C}$  ( $73 \pm 3^\circ\text{F}$ ) for at least 24 hours prior to and during testing.

Physical Property	Test Standard	Value
Density	ASTM C 642-90	$1.10 \pm 0.034$ g/cu cm ( $68.63 \pm 2.11$ lb/cu ft)
Durometer Hardness	ASTM D 2240-97 Shore A	$72 \pm 6^1$
Compression Deformation under 1000 kPa (145 psi)	ASTM D 575 – Test Method B Test of Specified Force	$9 \pm 4$ %
Compression Set	ASTM D 395 – Illinois Modified Test Method B Compression Set under Constant Deflection in Air	$5 \pm 3$ % <sup>2</sup>
Weathering (70 hrs at 70 °C (158 °F)) Hardness retained	ASTM D 573	98 %, minimum
Freeze/thaw when exposed to deicing chemicals	ASTM C 672-91	3 % loss, maximum

<sup>1</sup> Average of three tests over a 28 mm (1.12 in.) diameter sample.

<sup>2</sup> Samples compressed to 75 percent of initial height.

Recycled rubber adjusting rings shall have no void areas, cracks, or tears, and have no effects due to exposure to ultraviolet light. The actual diameter or length shall not vary more than 3 mm (0.125 in.) from the specified diameter or length. Variations in height are limited to  $\pm 1.6$  mm (0.063 in.) for parts up to 50 mm (2 in.)."

Revise Article 603.08 of the Standard Specifications to read:

**"603.08 Adjusting Rings.** As an option to Articles 603.03 through 603.07, the adjustment of frames and grates may be accomplished through the use of adjusting rings that fit on top of the frame. These adjusting rings shall be fabricated as a one-piece assembly from gray iron, ductile iron or structural steel. They shall provide a structural capacity equal to or greater than the existing frame and shall not affect the opening size or surface appearance. The rings shall have a device for positively positioning and fastening the ring to the existing frame to prevent movement under traffic."

## **Flagger Vests**

Effective: April 1, 2003

Revise the first sentence of Article 701.04(c)(1) of the Standard Specifications to read:

"The flagger shall be stationed to the satisfaction of the Engineer and be equipped with a fluorescent orange, fluorescent yellow/green or a combination of fluorescent orange and fluorescent yellow/green vest meeting the requirements of the American National Standards Institute specification ANSI/ISEA 107-1999 for Conspicuity Class 2 garments and approved flagger traffic control signs conforming to Standard 702001 and Article 702.05(e)."

Revise Article 701.04(c)(6) of the Standard Specifications to read:

"(6) Nighttime Flagging. The flagger station shall be lit by additional overhead lighting other than streetlights. The flagger shall be equipped with a fluorescent orange or fluorescent orange and fluorescent yellow/green garment meeting the requirements of the American National Standards Institute specification ANSI/ISEA 107-1999 for Conspicuity Class 2 garments."

## **Epoxy Coatings for Steel Reinforcement**

Effective: April 1, 2003

Revise Article 1006.10(b)(2) of the Standard Specifications to read:

"(2) Epoxy Coated Reinforcement Bars. Epoxy coated reinforcement bars shall conform to the requirements of AASHTO M 284M (M 284), except:

- a. The maximum thickness of epoxy coating on spiral reinforcement, coated after fabrication, shall be 0.5 mm (20 mils).
- b. No more than eight of the holidays permitted shall be in any 300 mm (1 ft) of length for continuity of coating.

The epoxy coating applicator shall be certified under the Concrete Reinforcing Steel Institute's (CRSI) Epoxy Plant Certification Program.

The epoxy coater shall provide access for the Engineer at any time during production or shipping. Random bars may be checked at the epoxy coater's facility or the jobsite for coating uniformity, thickness and discontinuity; cracks on the bends; and other damaged areas. Upon request, the coater shall provide samples for testing by the Engineer.

Bars may be sheared or sawn to length after coating, provided end damage to coating does not extend more than 15 mm (1/2 in.) back and the cut end is patched before any visible oxidation appears. Flame cutting will not be permitted."

Add the following paragraph after the first paragraph of Article 1006.11(b) of the Standard Specifications:

"The epoxy coating applicator shall be certified under the Concrete Reinforcing Steel Institute's (CRSI) Epoxy Plant Certification Program."

## Stone for Erosion Protection, Sediment Control, and Rockfill

Effective: January 1, 2004

Revise the first, second, and third sentences of Article 281.04(a) of the Standard Specifications to read:

"Class A1 bedding material shall be used with riprap Classes A4, A5, B4, and B5. Class A2 bedding material shall be used with riprap Classes A6, A7, B6, and B7. When filter fabric is used, the following substitutions of bedding material may be made: Quality B may be used in lieu of Quality A; Gradation CA 3 may be used in lieu of Gradation RR 1; and Gradation CA 1 may be used in lieu of Gradation RR 2."

Revise Article 1005.01 of the Standard Specifications to read:

**"1005.01 Stone for Erosion Protection, Sediment Control, and Rockfill.** The material will be sampled and inspected according to the Bureau of Materials and Physical Research's policy memorandum, "Inspection of Stone for Erosion Protection, Sediment Control, and Rockfill". The material shall meet the following requirements.

- (a) Description. The material shall be stone, quarried from undisturbed, consolidated deposits (ledges) of rock reasonably free of shale and shaly stone. The ledges shall be sufficiently thick to produce the desired dimensions. The stone shall be reasonably free of laminations, seams, cracks, and other structural defects or imperfections tending to destroy its resistance to weather. Field stone or boulders will not be accepted.

Bedding material shall be crushed stone, crushed gravel, crushed sandstone, or crushed slag meeting the requirements of Article 1004.01(a).

- (b) Quality. The stone shall meet the following quality requirements.

- (1) Stone for Erosion Protection or Sediment Control. The material shall be quarried from ledges meeting the quality designations listed in the following table.

QUALITY OF STONE FOR EROSION PROTECTION AND SEDIMENT CONTROL		
QUALITY TEST	QUALITY A <sup>2/3/4/</sup>	QUALITY B <sup>2/</sup>
Na <sub>2</sub> SO <sub>4</sub> Soundness 5 Cycle, AASHTO T 104 <sup>1/</sup> Max. % Loss	15	25

1/ As modified by the Department.

2/ Elongated pieces (length is greater than five times the average thickness) shall not exceed ten percent by weight.

3/ The stone, when checked in a full gradation product, shall have a specific gravity (dry) greater than 2.450 as determined by the Department.

4/ The stone shall be reasonably free of chert.

In addition to the above quality requirements, crushed slag used as a bedding material shall also meet the Department's "Test for Leachate".

(2) Stone for Rockfill. The material shall be quarried from ledges consisting of sound, durable rock reasonably free of objectionable, deleterious material as determined by the Department.

(c) Gradation. The stone shall meet the following gradation requirements.

(1) Stone for Erosion Protection or Sediment Control. The material shall meet the gradation limits listed in the following tables. All gradations produced shall be well graded.

BEDDING MATERIAL GRADATIONS					
GRAD. NO.	Percent Passing Sieves				
	100 mm	75 mm	50 mm	37.5 mm	4.75 mm
RR 1		100		53±23	8±8
RR 2	100		53±23		8±8

BEDDING MATERIAL GRADATIONS (ENGLISH)					
GRAD. NO.	Percent Passing Sieves				
	4 in.	3 in.	2 in.	1 1/2 in.	No. 4
RR 1		100		53±23	8±8
RR 2	100		53±23		8±8

EROSION PROTECTION AND SEDIMENT CONTROL GRADATIONS														
Grad. No.	Percent Passing Rock Size (kg)													
	455 <sup>1/</sup>	270 <sup>1/</sup>	180 <sup>1/</sup>	135	75	70 <sup>1/</sup>	40	20 <sup>1/</sup>	18	5	4	3	1	0.5
RR 3								100			50±20			8±8
RR 4						100			50±20					8±8
RR 5			100				50±20						8±8	
RR 6		100			50±20							8±8		
RR 7	100			50±20						8±8				

EROSION PROTECTION AND SEDIMENT CONTROL GRADATIONS														
Grad. No.	Percent Passing Rock Size (lb)													
	1000 <sup>1/</sup>	600 <sup>1/</sup>	400 <sup>1/</sup>	300	170	150 <sup>1/</sup>	90	50 <sup>1/</sup>	40	12	10	6	3	1
RR 3								100			50±20			8±8
RR 4						100			50±20					8±8
RR 5			100				50±20						8±8	
RR 6		100			50±20							8±8		
RR 7	100			50±20						8±8				

1/ Five percent by weight may be oversize. Each oversize piece shall not exceed the maximum size of the gradation by more than 20 percent.

(2) Stone for Rockfill. The material may be shot rock, primary crusher run, or other specified gradations approved by the Department."

## **Hand Vibrator**

Effective: November 1, 2003

Add the following paragraph to Article 1103.17(a) of the Standard Specifications:

"The vibrator shall have a non-metallic head for areas containing epoxy coated reinforcement. The head shall be coated by the manufacturer. The hardness of the non-metallic head shall be less than the epoxy coated reinforcement, resulting in no damage to the epoxy coating. Slip-on covers will not be allowed."



**Working Days**

Effective: January 1, 2002

The Contractor shall complete the work within   \*   working days.

\* Completion date for this project is May 5, 2006

## Bituminous Base Course / Widening Superpave

Effective: April 1, 2002  
Revised: January 1, 2003

**Description.** This work shall consist of constructing bituminous base course Superpave and bituminous concrete base course widening Superpave according to Sections 355 and 356 respectively, of the Standard Specifications and the special provision, "Quality Control/Quality Assurance of Bituminous Concrete Mixtures" except as modified herein.

Revise Article 355.02(d) of the Standard Specifications to read:

"(d) RAP Material (Note3)"

Revise Note 2 of Article 355.02 of the Standard Specifications to read:

"Note 2. Unless otherwise specified on the plans, the bituminous material shall be performance graded (PG) asphalt cement (AC) , PG58-22. When more than 15 percent RAP is used, a softer PG binder may be required as determined by the Engineer. When the pavement has a structural number (D<sub>t</sub>) of 3.00 or less, the low temperature grade of the asphalt cement shall be lowered one grade (i.e. PG58-28 replaces PG58-22)."

Add the following to the end Article 355.02 of the Standard Specifications:

"Note 3. RAP shall meet the requirements of the special provision "RAP for Use in Bituminous Concrete Mixtures"."

Add the following to Article 355.03 of the Standard Specifications:

"(k) Superpave Gyratory Compactor (Note 6)  
(l) Ignition Oven (Note 7)

Note 6. The Superpave gyratory compactor (SGC) shall be used for all laboratory mixture compaction.

Note 7. The ignition oven shall be used for determination of AC content. The ignition oven shall also be used to recover aggregates for all required washed gradations. The Engineer may waive the ignition oven requirement for AC content if the aggregates to be used are known to have ignition AC content calibration factors which exceed 1.5 percent. If the calibration factor exceeds 1.5 percent other IDOT approved methods shall be utilized for determination of AC content."

Revise Article 355.05 of the Standard Specifications to read:

**"355.05 Mixture Design.** The Contractor shall submit mix designs for approval, for each required mixture. Mix designs shall be developed by Level III personnel who have completed the course, "Superpave Mix Design Upgrade". The mixtures shall be designed according to the respective Illinois Modified AASHTO references listed below:

AASHTO MP 2    Standard Specification for Superpave Volumetric Mix Design

AASHTO PP 2    Standard Practice for Short and Long Term Aging of Hot Mix Asphalt (HMA)

- AASHTO PP 19 Standard Practice for Volumetric Analysis of Compacted Hot Mix Asphalt (HMA)
- AASHTO PP 28 Standard Practice for Designing Superpave HMA
- AASHTO T 209 Theoretical Maximum Specific Gravity and Density of Bituminous Paving Mixtures
- AASHTO T 312 Preparing and Determining the Density of Hot Mix Asphalt (HMA) Specimens by Means of the Superpave Gyratory Compactor
- AASHTO T 308 Determining the Asphalt Content of Hot Mix Asphalt (HMA) by the Ignition Method

(a) Job Mix Formula (JMF). The JMF shall be according to the following limits:

<u>Ingredient</u>	<u>Percent by Dry Weight</u>
Aggregate .....	93.0 to 96.0
Asphalt Cement.....	4.0 to 7.0
Dust/AC Ratio.....	1.4

When RAP material is being used, the JMF shall be according to the following limits:

<u>Ingredient</u>	<u>Percent by Dry Weight</u>
Virgin Aggregate(s) .....	46.0 to 96.0
RAP Material(s) (Note 1) .....	0 to 50
Mineral Filler (if required).....	0 to 5.0
Asphalt Cement.....	4.0 to 7.0
Dust/AC Ratio.....	1.4

Note 1. If specified on the plans, the maximum percentage of RAP shall be as specified therein.

It is recommended that the selected combined aggregate gradation not pass through the restricted zones specified in Illinois Modified AASHTO MP 2.

Bituminous concrete binder course Superpave mixture IL-25.0 or IL-19.0 meeting the requirements of the special provision, "Superpave Bituminous Concrete Mixtures" may also be used. The minimum compacted lift thickness specified therein shall apply.

(b) Volumetric Requirements.

Design Compactive Effort	Design Air Voids Target (%)
N <sub>DES</sub> = 50	2.0

- (c) Determination of Need for Anti-Stripping Additive. The mixture designer shall determine if an additive is needed in the mix to prevent stripping. The determination will be made on the basis of tests performed according to Illinois Modified AASHTO T 283 using 4 in. Marshall bricks. To be considered acceptable by the Engineer as a mixture not susceptible to stripping, the ratio of conditioned to unconditioned split tensile strengths (TSR) shall be equal to or greater than 0.75. Mixtures, either with or without an additive, with TSR values less than 0.75 will be considered unacceptable.

If it is determined that an additive is required, the additive may be hydrated lime, slaked quicklime, or a liquid additive, at the Contractor's option. The liquid additive shall be selected from the Department's list of approved additives and may be limited to those which have exhibited satisfactory performance in similar mixes.

Dry hydrated lime shall be added at a rate of 1.0 to 1.5 percent by weight of total dry aggregate. Slurry shall be added in such quantity as to provide the required amount of hydrated lime solids by weight of total dry aggregate. The exact rate of application for all anti-stripping additives will be determined by the Engineer. The method of application shall be according to Article 406.12 of the Standard Specifications."

Revise Article 355.06 of the Standard Specifications to read:

**"355.06 Mixture Production.** The asphalt cement shall be transferred to the asphalt tanks and heated to a temperature of 120 °C (250 °F) to 175 °C (350 °F). If the loading temperature exceeds 175 °C (350 °F), the asphalt shall not be used until it has cooled to 175 °C (350 °F). Wide variations in temperature which affect the amount of asphalt delivered will not be permitted.

When a hot-mix plant conforming to Article 1102.01 is used, the aggregate shall be dried and heated in the revolving dryer to a temperature of 120 °C (250 °F) to 175 °C (350 °F).

The aggregate and bituminous material used in the bituminous aggregate mixture shall be measured separately and accurately by weight or by volume. When the aggregate is in the mixer, the bituminous material shall be added and mixing continued for a minimum of 30 seconds and until a homogeneous mixture is produced in which all particles of the aggregate are coated. The mixing period, size of the batch and the production rate shall be approved by the Engineer.

The ingredients shall be heated and combined in such a manner as to produce a mixture which, when discharged from the mixer, shall be workable and vary not more 10 °C (20 °F) from the temperature set by the Engineer.

When RAP material(s) is used in the bituminous aggregate mixture, the virgin aggregate(s) shall be dried and heated in the dryer to a temperature that will produce the specified resultant mix temperature when combined with the RAP material.

The heated virgin aggregates and mineral filler shall be combined with RAP material in such a manner as to produce a bituminous mixture which when discharged from the mixer shall not vary more than 15 °C (30 °F) from the temperature set by the Engineer. The combined ingredients shall be mixed for a minimum of 35 seconds and until a homogeneous mixture as to composition and temperature is obtained. The total mixing time shall be a minimum of 45 seconds consisting of dry and wet mixing. Variation in wet and dry mixing times may be permitted, depending on the moisture content and amount of salvaged material used. The mix temperature shall not exceed 175 °C (350 °F). Wide variations in the mixture temperature will be cause for rejection of the mix.

- (a) Personnel. The QC Manager and Level I Technician shall have successfully completed the Department's "Superpave Field Control Course".
- (b) Required Tests. Testing shall be conducted to control the production of the bituminous mixture at a frequency not less than that listed for Non-Class I mixtures in the special provision "QC/QA of Bituminous Concrete Mixtures".

During production, the ratio of minus 75 µm (#200) sieve material to total asphalt cement shall be not less than 0.6 nor more than 1.6, and the moisture content of the mixture at discharge from the mixer shall not exceed 0.5 percent. If at any time the ratio of minus 75 µm (#200) material to asphalt or moisture content of the mixture falls outside the stated limits, production of the mix shall cease. The cause shall be determined and corrective action satisfactory to the Engineer shall be initiated prior to resumption of production.

During production, mixture containing an anti-stripping additive will be tested by the Engineer for stripping according to Illinois Modified AASHTO T 283. If the mixture fails to meet the TSR criteria for acceptance, no further mixture will be accepted until the Contractor takes such action as is necessary to furnish a mixture meeting the criteria.

- (c) Control Charts/Limits. Control charts/limits shall be according to QC/QA requirements for Non-Class I Mixtures."

Revise Article 355.08 of the Standard Specifications to read:

**"355.08 Placing.** The bituminous mixture shall be placed with a spreading and finishing machine. The minimum compacted thickness of each lift shall be according to the following table:

Nominal Maximum Aggregate Size of Mixture	Minimum Compacted Lift Thickness
CA 10 - 19 mm (3/4 in.)	57 mm (2 1/4 in.)
CA 6 - 25 mm (1 in.)	76 mm (3 in.)

The maximum compacted thickness of each lift shall be 100 mm (4 in.). If the Contractor elects to substitute an approved vibratory roller for one of the required rollers, the maximum compacted thickness of the each lift, excluding the top lift, may be increased to 150 mm (6 in.) provided the required density is obtained.

The surface of each lift shall be clean and dry before succeeding lifts are placed."

Revise Article 355.13 of the Standard Specifications to read:

**"355.13 Basis of Payment.** This work will be paid for at the contract unit price per square meter (square yard) for BITUMINOUS BASE COURSE SUPERPAVE of the thickness specified."

Revise Article 356.02 of the Standard Specifications to read:

**"356.02 Materials.** The materials for the bituminous concrete mixture shall meet the requirements of Article 355.02, be designed according to Article 355.05 and produced according to Article 355.06. Bituminous concrete binder course Superpave mixture IL-25.0 or IL-19.0 meeting the requirements of the special provision, "Superpave Bituminous Concrete Mixtures" may also be used. The minimum compacted lift thickness specified therein shall apply."

Revise the first paragraph of Article 356.06 of the Standard Specifications to read:

**"356.06 Base Course Widening.** The bituminous concrete mixture shall be transported according to Article 406.14."

Revise the second sentence of the fifth paragraph of Article 356.06 of the Standard Specifications to read:

"The minimum compacted thickness of each lift shall be according to the table shown in Article 355.08."

Revise the first paragraph of Article 356.11 of the Standard Specifications to read:

**"356.11 Basis of Payment.** Where the Department requires that bituminous concrete be used, this work will be paid for at the contract unit price per square meter (square yard) for BITUMINOUS CONCRETE BASE COURSE WIDENING SUPERPAVE of the thickness specified."

## Organic Zinc-Rich Paint System

Effective: November 1, 2001

Revised: August 1, 2003

Add the following to Section 1008 of the Standard Specifications:

**"1008.26 Organic Zinc-Rich Paint System.** The organic zinc-rich paint system shall consist of an organic zinc-rich primer, an epoxy or urethane intermediate coat, and aliphatic urethane finish coats. It is intended for use over blast-cleaned steel when three-coat shop applications are specified. The system is also suitable for field painting blast-cleaned existing structures.

### (a) General Requirements.

- (1) Compatibility. Each coating in the system shall be supplied by the same paint manufacturer.
- (2) Toxicity. Each coating shall contain less than 0.01 percent lead in the dry film and no more than trace amounts of hexavalent chromium, cadmium, mercury or other toxic heavy metals.
- (3) Volatile Organics. The volatile organic compounds of each coating shall not exceed 420 g/L (3.5 lb/gal) as applied.

### (b) Test Panel Preparation.

- (1) Substrate and Surface Preparation. Test panels shall be AASHTO M 270M, Grade 250 (M 270 Grade 36), hot-rolled steel measuring 100 mm x 150 mm (4 in. x 6 in.). Panels shall be blast-cleaned per SSPC-SP5 white metal condition using metallic abrasive. The abrasive shall be a 60/40 mix of shot and grit. The shot shall be an SAE shot number S230 and the grit an SAE number G40. Hardness of the shot and grit shall be Rockwell C45. The anchor profile shall be 40-65 microns (1.5-2.5 mils) measured according to ASTM D 4417, Method C.
- (2) Application and Curing. All coatings shall be spray applied at the manufacturer's recommended film thickness. The coated panels shall be cured at least 14 days at  $24^{\circ}\text{C} \pm 1^{\circ}\text{C}$  ( $75^{\circ}\text{F} \pm 2^{\circ}\text{F}$ ) and  $50 \pm 5$  percent relative humidity.
- (3) Scribing. The test panels shall be scribed according to ASTM D 1654 with a single "X" mark centered on the panel. The rectangular dimensions of the scribe shall have a top width of 50 mm (2 in.) and a height of 100 mm (4 in.). The scribe cut shall expose the steel substrate as verified with a microscope.
- (4) Number of Panels. All testing shall be performed on triplicate panels.

### (c) Zinc-Rich Primer Requirements.

- (1) Generic Type. This material shall be an organic zinc-rich epoxy or urethane primer. It shall be suitable for topcoating with epoxies, urethanes, and acrylics.

- (2) Zinc Dust. The zinc dust pigment shall comply with ASTM D 520, Type II.
  - (3) Slip Coefficient. The organic zinc coating shall meet a Class B AASHTO slip coefficient (0.50 or greater) for structural steel joints using ASTM A 325M (A 325) or A 490M (A 490) bolts.
  - (4) Salt Fog. There shall be no delamination, blistering, rust creepage at the scribe, or rusting at the scribe edges after 5,000 hours of salt fog exposure when tested according to ASTM B 117 and evaluated according to AASHTO R 31.
  - (5) Cyclic Exposure. There shall be no delamination, blistering, rust creepage at the scribe, or rusting at the scribe edges after 5,000 hours of cyclic exposure when tested according to ASTM D 5894 and evaluated according to AASHTO R 31.
  - (6) Humidity Exposure. There shall be no delamination, blistering, rust creepage at the scribe, or rusting at the scribe edges after 4,000 hours of humidity exposure when tested according to ASTM D 2247 and evaluated according to AASHTO R 31.
  - (7) Adhesion. The adhesion to an abrasively blasted steel substrate shall not be less than 6200 kPa (900 psi) when tested according to ASTM D 4541 Annex A4.
  - (8) Freeze Thaw Stability. There shall be no reduction of adhesion, which exceeds the test precision, after 30 days of freeze/thaw/immersion testing. One 24-hour cycle shall consist of 16 hours of approximately -30 °C (-22 °F) followed by 4 hours of thawing at 50 °C (122 °F) and 4 hours tap water immersion at 25 °C (77 °F). The test panels shall remain in the freezer on weekends and holidays.
- (d) Intermediate Coat Requirements.
- (1) Generic Type. This material shall be an epoxy or urethane. It shall be suitable as an intermediate coat over inorganic and organic zinc primers and compatible with acrylic, epoxy, and polyurethane topcoats.
  - (2) Color. The color of the intermediate coat shall be white or off-white.
- (e) Urethane Finish Coat Requirements.
- (1) Generic Type. This material shall be an aliphatic urethane. It shall be suitable as a topcoat over epoxies and urethanes.
  - (2) Color and Hiding Power. The finish coat shall match Munsell Glossy Color 7.5G 4/8 Interstate Green, 2.5YR 3/4 Reddish Brown, 10B 3/6 Blue, or 5B 7/1 Gray. The color difference shall not exceed 3.0 Hunter Delta E Units. Color difference shall be measured by instrumental comparison of the designated Munsell standard to a minimum dry film thickness of 75 microns (3 mils) of sample coating produced on a test panel according to ASTM D 823, Practice E, Hand-Held, Blade Film Application. Color measurements shall be determined on a spectrophotometer with 45 degrees circumferential/zero degrees geometry, illuminant C, and two degrees observer



angle. The spectrophotometer shall measure the visible spectrum from 380-720 nanometers with a wavelength interval and spectral bandpass of 10 nanometers.

The contrast ratio of the finish coat at 75 microns (3 mils) dry film thickness shall not be less than 0.99 when tested according to ASTM D 2805.

- (3) Weathering Resistance. Test panels shall be aluminum alloy measuring 300 mm x 100 mm (12 in. x 4 in.) prepared according to ASTM D 1730 Type A, Method 1 Solvent Cleaning. A minimum dry film thickness of 75 microns (3 mils) of finish coat shall be applied to three test panels according to ASTM D 823, Practice E, Hand Held Blade Film Application. The coated panels shall be cured at least 14 days at  $24^{\circ}\text{C} \pm 1^{\circ}\text{C}$  ( $75^{\circ}\text{F} \pm 2^{\circ}\text{F}$ ) and  $50 \pm 5$  percent relative humidity. The panels shall be subjected to 300 hours of accelerated weathering using the light and water exposure apparatus (fluorescent UV - condensation type) as specified in ASTM G 53-96 and ASTM G 154 (equipped with UVB-313 lamps). The cycle shall consist of 8 hours UV exposure at  $60^{\circ}\text{C}$  ( $140^{\circ}\text{F}$ ) followed by 4 hours of condensation at  $40^{\circ}\text{C}$  ( $104^{\circ}\text{F}$ ). After exposure, rinse the panel with clean water; allow to dry at room temperature for one hour. The exposed panels shall not show a color change of more than 3 Hunter Delta E Units.

(f) Three Coat System Requirements.

- (1) Finish Coat Color. For testing purposes, the color of the finish coat shall match Federal Standard No 595, color chip 14062 (green).
- (2) Salt Fog. When tested according to ASTM B 117 and evaluated according to AASHTO R 31, the paint system shall exhibit no spontaneous delamination and not exceed the following acceptance levels after 5,000 hours of salt fog exposure:

Salt Fog Acceptance Criteria (max)			
Blister Criteria	Rust Criteria		
Size/Frequency	Maximum Creep	Average Creep	% Rusting at Scribed Edges
#8 Few	4mm	1mm	1

- (3) Cyclic Exposure. When tested according to ASTM D 5894 and evaluated according to AASHTO R 31, the paint system shall exhibit no spontaneous delamination and not exceed the following acceptance levels after 5,000 hours of cyclic exposure:

Cyclic Exposure Acceptance Criteria (max)			
Blister Criteria	Rust Criteria		
Size/Frequency	Maximum Creep	Average Creep	% Rusting at Scribed Edges
#8 Few	2mm	1mm	1

- (4) Humidity Exposure. There shall be no delamination, blistering, rust creepage at the scribe, or rusting at the scribe edges after 4,000 hours of humidity exposure when tested according to ASTM D 2247 and evaluated according to AASHTO R 31.

- (5) Adhesion. The adhesion to an abrasively blasted steel substrate shall not be less than 6200 kPa (900 psi) when tested according to ASTM D 4541 Annex A4.
- (6) Freeze Thaw Stability. There shall be no reduction of adhesion, which exceeds the test precision, after 30 days of freeze/thaw/immersion testing. One 24 hour cycle shall consist of 16 hours of approximately -30 °C (-22 °F) followed by 4 hours of thawing at 50 °C (122 °F) and 4 hours tap water immersion at 25 °C (77 °F). The test panels shall remain in the freezer mode on weekends and holidays.
- (g) Qualification Samples and Tests. The manufacturer shall supply, to an independent test laboratory and to the Department, samples of the organic zinc-rich primer, epoxy or urethane intermediate coat, and aliphatic urethane finish coats for evaluation. Prior to approval and use, the manufacturer shall submit a notarized certification of the independent laboratory, together with results of all tests, stating that these materials meet the requirements as set forth herein. The certified test report shall state lots tested, manufacturer's name, product names, and dates of manufacture. New certified test results and samples for testing by the Department shall be submitted any time the manufacturing process or paint formulation is changed. All costs of testing, other than tests conducted by the Department, shall be borne by the manufacturer.
- (h) Acceptance Samples and Certification. A 1 L (1 qt) sample of each lot of paint produced for use on state or local agency projects shall be submitted to the Department for testing, together with a manufacturer's certification. The certification shall state that the formulation for the lot represented is essentially identical to that used for qualification testing. All acceptance samples shall be witnessed by a representative of the Illinois Department of Transportation. The organic zinc-rich primer, epoxy or urethane intermediate coat, and aliphatic urethane finish coats shall not be used until tests are completed and they have met the requirements as set forth herein."

**Freeze-Thaw Rating**

Effective: November 1, 2002

Revise the first sentence of Article 1004.02(f) of the Standard Specifications to read:

"When coarse aggregate is used to produce portland cement concrete for base course, base course widening, pavement, driveway pavement, sidewalk, shoulders, curb, gutter, combination curb and gutter, median, paved ditch or their repair using concrete, the gradation permitted will be determined from the results of the Department's Freeze-Thaw Test."

## **Traffic Structures**

Effective: November 1, 2002

Add the following sentence to the end of the first paragraph of Article 1069.01(a)(1) of the Standard Specifications:

"Light poles shall be designed for 145 km/hr (90 mph) wind velocity and a minimum design life of 50 years."

Add the following sentence to the end of the third paragraph of Article 1069.04(a) of the Standard Specifications:

"Light towers shall be designed for 145 km/hr (90 mph) wind velocity and a minimum design life of 50 years."

Revise the last sentence of the first paragraph of Article 1077.03(a)(1) of the Standard Specifications to read:

"The design shall be according to AASHTO "Standard Specification for Structural Supports for Highway Signs, Luminaries and Traffic Signals" 1994 Edition for 130 km/hr (80 mph) wind velocity. However the arm-to-pole connection shall be according to the "ring plate" detail as shown in Figure 11-1(f) of the 2002 Interim, to the AASHTO "Standard Specification for Structural Supports for Highway Signs, Luminaries and Traffic Signals" 2001 4<sup>th</sup> Edition."

## Temporary Erosion Control

Effective: November 1, 2002

Revise the fifth sentence of the third paragraph of Article 280.04(a) of the Standard Specifications to read:

"This work may be constructed of hay or straw bales, extruded UV resistant high density polyethylene panels, erosion control blanket, mulch barrier, aggregate barriers, excavation, seeding, or mulch used separately or in combination, as approved, by the Engineer."

Add the following paragraphs after the fifth paragraph of Article 280.04(a) of the Standard Specifications.

"A ditch check constructed of extruded, UV resistant, high density polyethylene panels, "M" pins and erosion control blanket shall consist of the following materials:

Extruded, UV resistant, high density polyethylene panels shall have a minimum height of 250 mm (10 in.) and minimum length of 1.0 m (39.4 in.). The panels shall have a 51 mm (2 in.) lip along the bottom of the panel. Each panel shall have a single rib thickness of 4 mm (5/32 in.) with a 12 mm (1/2 in.) distance between the ribs. The panels shall have an average apparent opening size equal to 4.75 mm (No. 4) sieve, with an average of 30 percent open area. The tensile strength of each panel shall be 26.27 kN/m (1800 lb/ft) in the machine direction and 7.3 kN/m (500 lb/ft) in the transverse direction when tested according to ASTM D 4595.

"M" pins shall be at least 76 mm (3 in.) by 686 mm (27 in.), constructed out of deformed grade C1008 D3.5 rod (0.211 in. diameter). The rod shall have a minimum tensile strength of 55 MPa (8000 psi).

Erosion control blanket shall conform to Article 251.04.

A section of erosion control blanket shall be placed transverse to the flowline direction of the ditch prior to the construction of the polyethylene ditch check. The length of the section shall extend from the top of one side of the ditch to the top of the opposite side of the ditch, while the width of the section shall be one roll width of the blanket. The upstream edge of the erosion control blanket shall be secured in a 100 mm (4 in.) trench. The blanket shall be secured in the trench with 200 mm (8 in.) staples placed at 300 mm (1 ft) intervals along the edge before the trench is backfilled. Once the upstream edge of the blanket is secured, the downstream edge shall be secured with 200 mm (8 in.) staples placed at 300 mm (1 ft) intervals along the edge. The polyethylene ditch check shall be installed in the middle of the erosion control blanket, with the lip of each panel facing outward.

The ditch check shall consist of two panels placed back to back forming a single row. Placement of the first two panels shall be at the toe of the backslope or sideslope, with the panels extending across the bottom of the ditch. Subsequent panels shall extend both across the bottom of the ditch and up the opposite sideslope, as well as up the original backslope or sideslope at the distance determined by the Engineer.

The M pins shall be driven through the panel lips to secure the panels to the ground. M pins shall be installed in the center of the panels with adjacent panels overlapping the ends a minimum of 50 mm (2 in.). The pins shall be placed through both sets of panels at each overlap. They shall be installed at an interval of three M pins per one meter (39 in.) length of ditch check. The panels shall be wedged into the M pins at the top to ensure firm contact between the entire bottom of the panels and the soil."

## **Controlled Aggregate Mixing System**

Effective: November 1, 2002

Revise the fourth sentence of the first paragraph of Article 311.05(b) of the Standard Specifications to read:

"The water and granular material shall be mixed through a controlled aggregate mixing system. The system shall consist of a mechanical mixing device and aggregate and water measuring devices, meeting the approval of the Engineer."

Revise the third and fourth sentences of the fourth paragraph of Article 351.05(b) of the Standard Specifications to read:

"The water and aggregate shall be mixed through a controlled aggregate mixing system. The system shall consist of a mechanical mixing device and aggregate and water measuring devices, meeting the approval of the Engineer."

Delete the third sentence of the first paragraph of Article 351.05(c) of the Standard Specifications.

Revise the second and third sentences of the first paragraph of Article 481.04(a) of the Standard Specifications to read:

"The water and aggregate shall be mixed through a controlled aggregate mixing system. The system shall consist of a mechanical mixing device and aggregate and water measuring devices, meeting the approval of the Engineer."

## **Epoxy Coating on Reinforcement**

Effective: April 1, 1997

Revised: January 1, 2003

For work outside the limits of bridge approach pavement, all references to epoxy coating in the Highway Standards and Standard Specifications for reinforcement, tie bars and chair supports will not apply for pavement, shoulders, curb, gutter, combination curb and gutter and median.

## **Preformed Recycled Rubber Joint Filler**

Effective: November 1, 2002

Revise Article 503.02(c) of the Standard Specifications to read:

"(c) Preformed Expansion Joint Filler.....1051"

Revise Article 637.02(d) of the Standard Specifications to read:

"(d) Preformed Expansion Joint Filler.....1051"

Add the following Article to Section 1051 of the Standard Specifications:

"1051.10 Preformed Recycled Rubber Joint Filler. Preformed recycled rubber joint filler shall consist of ground tire rubber, free of steel and fabric, combined with ground scrap or waste polyethylene. It shall not have a strong hydrocarbon or rancid odor and shall meet the physical property requirements of ASTM D 1752. Water absorption by volume shall not exceed 5.0 percent."



## Work Zone Traffic Control Devices

Effective: January 1, 2003

Revised: April 1, 2003

Add the following to Article 702.01 of the Standard Specifications:

"All devices and combinations of devices shall meet the requirements of the National Cooperative Highway Research Program (NCHRP) Report 350 for their respective categories. The categories are as follows:

Category 1 includes small, lightweight, channelizing and delineating devices that have been in common use for many years and are known to be crashworthy by crash testing of similar devices or years of demonstrable safe performance. These include cones, tubular markers, flexible delineators and plastic drums with no attachments. Category 1 devices shall be crash tested and accepted or may be self-certified by the manufacturer.

Category 2 includes devices that are not expected to produce significant vehicular velocity change but may otherwise be hazardous. These include drums and vertical panels with lights, barricades and portable sign supports. Category 2 devices shall be crash tested and accepted for Test Level 3.

Category 3 includes devices that are expected to cause significant velocity changes or other potentially harmful reactions to impacting vehicles. These include crash cushions, truck mounted attenuators and other devices not meeting the definitions of Category 1 or 2. Category 3 devices shall be crash tested and accepted for Test Level 3.

Category 4 includes portable or trailer-mounted devices such as arrow boards, changeable message signs, temporary traffic signals and area lighting supports. Currently, there is no implementation date set for this category and it is exempt from the NCHRP 350 compliance requirement.

The Contractor shall provide a manufacturer's self-certification letter for each Category 1 device and an FHWA acceptance letter for each Category 2 and Category 3 device used on the contract. The letters shall state the device meets the NCHRP 350 requirements for its respective category and test level, and shall include a detail drawing of the device."

Delete the third, fourth and fifth paragraphs of Article 702.03(b) of the Standard Specifications.

Delete the third sentence of the first paragraph of Article 702.03(c) of the Standard Specifications.

Delete the fourth paragraph of Article 702.05(a) of the Standard Specifications.

Revise the sixth paragraph of Article 702.05(a) of the Standard Specifications to read:

"When the work operations exceed four days, all signs shall be post mounted unless the signs are located on the pavement or define a moving or intermittent operation. When approved by the Engineer, a temporary sign stand may be used to support a sign at 1.2 m (5 ft) minimum where posts are impractical. Longitudinal dimensions shown on the plans for the placement of signs may be increased up to 30 m (100 ft) to avoid obstacles, hazards or to improve sight distance, when approved by the Engineer. "ROAD CONSTRUCTION AHEAD" signs will also be required on side roads located within the limits of the mainline "ROAD CONSTRUCTION AHEAD" signs."

Delete all references to "Type 1A barricades" and "wing barricades" throughout Section 702 of the Standard Specifications.

## **Fluorescent Orange Sheeting on Drums**

Effective: November 1, 2000

Revised: January 1, 2003

Revise the first sentence of the first paragraph of Article 702.03(e) of the Standard Specifications to read:

"Drums shall be nonmetallic and have alternating reflectorized Type AA or Type AP fluorescent orange and reflectorized white horizontal, circumferential stripes."

## **Vertical Barricades**

Effective: November 1, 2002

Revised: January 1, 2003

Add the following to Article 702.03 of the Standard Specifications:

"(h) Vertical Barricades. Vertical Barricades shall meet the requirements of the National Cooperative Highway Research Program (NCHRP) Report 350 and the special provision "Work Zone Traffic Control Devices". Vertical barricades may be used in lieu of cones, drums or Type I and Type II barricades to channelize traffic. Vertical barricades shall not be used in lane closure tapers."

## Temporary Concrete Barrier

Effective: October 1, 2002  
Revised: November 1, 2003

Revise Section 704 of the Standard Specifications to read:

### "SECTION 704. TEMPORARY CONCRETE BARRIER

**704.01 Description.** This work shall consist of furnishing, placing, maintaining, relocating and removing precast concrete barrier at temporary locations as shown on the plans or as directed by the Engineer.

**704.02 Materials.** Materials shall meet the requirements of the following Articles of Section 1000 - Materials:

Item	Article/Section
(a) Portland Cement Concrete .....	1020
(b) Reinforcement Bars (Note 1) .....	1006.10(a)(b)
(c) Connecting Pins and Anchoring Pins .....	1006.09
(d) Connecting Loop Bars (Note 2)	
(e) Rapid Set Mortar (Note 3)	

Note 1. Reinforcement bars shall be Grade 400 (Grade 60).

Note 2. Connecting loop bars shall be smooth bars conforming to the requirements of ASTM A 36.

Note 3. Rapid set materials shall be obtained from the Department's approved list of Packaged, Dry, Rapid Hardening Cementitious Materials for Concrete Repairs. For a rapid set mortar mixture, one part packaged rapid set cement shall be combined with two parts fine aggregate, by volume or a packaged rapid set mortar shall be used. Mixing of the rapid set mortar shall be according to the manufacturer's instructions.

### CONSTRUCTION REQUIREMENTS

**704.03 General.** Precast concrete barrier produced after October 1, 2002 shall meet National Cooperative Highway Research Program (NCHRP) Report 350, Category 3, Test Level 3 requirements and have the F shape. Precast concrete barrier shall be constructed according to the Bureau of Materials and Physical Research's Policy Memorandum "Quality Control/Quality Assurance Program for Precast Concrete Products", applicable portions of Sections 504 and 1020, and to the details shown on the plans.

Precast units shall not be removed from the casting beds until a flexural strength of 2,000 kPa (300 psi) or a compressive strength of 10,000 kPa (1400 psi) is attained. When the concrete has attained a compressive strength according to Article 1020.04, and not prior to four days after casting, the units may be loaded, shipped and used.

**704.04 Installation.** F shape barrier units shall be seated on bare, clean pavement or paved shoulder and pinned together in a smooth, continuous line at the exact locations provided by the Engineer. The barrier unit at each end of the installation shall be secured to the pavement or paved shoulder using six anchoring pins and protected with an impact attenuator as shown on the plans.

F shape and New Jersey shape barrier units shall not be mixed in the same run.

Barrier units or attachments damaged during transportation or handling, or by traffic during the life of the installation, shall be repaired or replaced by the Contractor at his/her expense. The Engineer will be the sole judge in determining which units or attachments require repair or replacement.

The temporary barriers shall be removed when no longer required by the contract. After removal, all anchoring holes in the pavement or paved shoulder shall be filled with a rapid set mortar. Only enough water to permit placement and consolidation by rodding shall be used and the material shall be struck-off flush.

**704.05 New Jersey Shape Barrier.** New Jersey shape barrier produced prior to October 1, 2002 according to earlier Department standards, may be used until January 1, 2008.

Barrier units or attachments damaged during transportation or handling, or by traffic during the life of the installation, shall be repaired or replaced by the Contractor at his/her expense. The Engineer will be the sole judge in determining which units or attachments require repair or replacement.

F shape and New Jersey shape barrier units shall not be mixed in the same run.

The barrier unit at each end of the installation shall be secured to the pavement or paved shoulder using six dowel bars and protected with an impact attenuator as shown on the plans.

The temporary barriers shall be removed when no longer required by the contract. After removal, all anchoring holes in the pavement or paved shoulder shall be filled with a rapid set mortar. Only enough water to permit placement and consolidation by rodding shall be used and the material shall be struck-off flush.

**704.06 Method of Measurement.** Temporary concrete barrier will be measured for payment in meters (feet) in place along the centerline of the barrier. When temporary concrete barrier is relocated within the limits of the jobsite, the relocated barrier will be measured for payment in meters (feet) in place along the centerline of the barrier.

**704.07 Basis of Payment.** When the Contractor furnishes the barrier units, this work will be paid for at the contract unit price per meter (foot) for TEMPORARY CONCRETE BARRIER or RELOCATE TEMPORARY CONCRETE BARRIER.

When the Department furnishes the barrier units, this work will be paid for at the contract unit price per meter (foot) for TEMPORARY CONCRETE BARRIER, STATE OWNED or RELOCATE TEMPORARY CONCRETE BARRIER, STATE OWNED.

Impact attenuators will be paid for separately."

## Concrete Admixtures

Effective: January 1, 2003

Revised: January 1, 2004

Revise Article 1020.05(b) of the Standard Specifications to read:

"(b) Admixtures. Except as specified, the use of admixtures to increase the workability or to accelerate the hardening of the concrete will be permitted only when approved in writing by the Engineer. The Department will maintain an Approved List of Concrete Admixtures. When the Department permits the use of a calcium chloride accelerator, it shall be according to Article 442.02, Note 5.

When the atmosphere or concrete temperature is 18 °C (65 °F) or higher, a retarding admixture meeting the requirements of Article 1021.03 shall be used in the Class BD Concrete and portland cement concrete bridge deck overlays. The amount of retarding admixture to be used will be determined by the Engineer. The proportions of the ingredients of the concrete shall be the same as without the retarding admixture except that the amount of mixing water shall be reduced, as may be necessary, in order to maintain the consistency of the concrete as required. In addition, a high range water-reducing admixture shall be used in Class BD Concrete. The amount of high range water-reducing admixture will be determined by the Engineer. At the option of the Contractor, a water-reducing admixture may be used. Type I cement shall be used.

For Class PC and PS Concrete, a retarding admixture may be added to the concrete mixture when the concrete temperature is 18 °C (65 °F) or higher. The Engineer may order or permit the use of a retarding or water-reducing admixture whenever the Engineer considers it appropriate.

At the Contractor's option, admixtures in addition to an air-entraining admixture may be used for Class PP-1 concrete. The accelerator shall be the non-chloride type. If a water-reducing or retarding admixture is used, the cement factor may be reduced a maximum 18 kg/cu m (0.30 hundredweight/cu yd). If a high range water-reducing admixture is used, the cement factor may be reduced a maximum 36 kg/cu m (0.60 hundredweight/cu yd). Cement factor reductions shall not be cumulative when using multiple admixtures. An accelerator shall always be added prior to a high range water-reducing admixture, if both are used.

If Class C fly ash or ground granulated blast-furnace slag is used in Class PP-1 concrete, a water-reducing or high range water-reducing admixture shall be used. However, the cement factor shall not be reduced if a water-reducing, retarding, or high range water-reducing admixture is used. In addition, an accelerator shall not be used.

For Class PP-2 or PP-3 concrete, a non-chloride accelerator followed by a high range water-reducing admixture shall be used, in addition to the air-entraining admixture. For Class PP-3 concrete, the non-chloride accelerator shall be calcium nitrite.

For Class PP-2 or PP-3 concrete, the Contractor has the option to use a water-reducing admixture. A retarding admixture shall not be used unless approved by the Engineer. A water-reducing, retarding, or high range water-reducing admixture shall not be used to reduce the cement factor.

When the air temperature is less than 13 °C (55 °F) for Class PP-1 or PP-2 concrete, the non-chloride accelerator shall be calcium nitrite.

For Class PP-4 concrete, a high range water-reducing admixture shall be used in addition to the air-entraining admixture. The Contractor has the option to use a water-reducing admixture. An accelerator shall not be used. For stationary or truck mixed concrete, a retarding admixture shall be used to allow for haul time. The Contractor has the option to use a mobile portland cement concrete plant according to Article 1103.04, but a retarding admixture shall not be used unless approved by the Engineer. A water-reducing, retarding, or high range water-reducing admixture shall not be used to reduce the cement factor.

If the Department specifies a calcium chloride accelerator for Class PP-1 concrete, the maximum chloride dosage shall be 1.0 L (1.0 quart) of solution per 45 kg (100 lb) of cement. The dosage may be increased to a maximum 2.0 L (2.0 quarts) per 45 kg (100 lb) of cement if approved by the Engineer. If the Department specifies a calcium chloride accelerator for Class PP-2 concrete, the maximum chloride dosage shall be 1.3 L (1.3 quarts) of solution per 45 kg (100 lb) of cement. The dosage may be increased to a maximum 2.6 L (2.6 quarts) per 45 kg (100 lb) of cement if approved by the Engineer.

For Class PV, MS, SI, RR, SC and SH concrete, at the option of the Contractor, or when specified by the Engineer, a water-reducing admixture or a retarding admixture may be used. The amount of water-reducing admixture or retarding admixture permitted will be determined by the Engineer. The air-entraining admixture and other admixtures shall be added to the concrete separately, and shall be permitted to intermingle only after they have separately entered the concrete batch. The sequence, method and equipment for adding the admixtures shall be approved by the Engineer. The water-reducing admixture shall not delay the initial set of the concrete by more than one hour. Type I cement shall be used.

When a water-reducing admixture is added, a cement factor reduction of up to 18 kg/cu m (0.30 hundredweight/cu yd), from the concrete designed for a specific slump without the admixture, will be permitted for Class PV, MS, SI, RR, SC and SH concrete. When an approved high range water-reducing admixture is used, a cement factor reduction of up to 36 kg/cu m (0.60 hundredweight/cu yd), from a specific water cement/ratio without the admixture, will be permitted based on a 14 percent minimum water reduction. This is applicable to Class PV, MS, SI, RR, SC and SH concrete. A cement factor below 320 kg/cu m (5.35 hundredweight/cu yd) will not be permitted for Class PV, MS, SI, RR, SC and SH concrete. A cement factor reduction will not be allowed for concrete placed underwater. Cement factor reductions shall not be cumulative when using multiple admixtures.

For use of admixtures to control concrete temperature, refer to Articles 1020.14(a) and 1020.14(b).

The maximum slumps given in Table 1 may be increased to 175 mm (7 in.) when a high range water-reducing admixture is used for all classes of concrete except Class PV and PP."

Revise Section 1021 of the Standard Specifications to read:

### **"SECTION 1021. CONCRETE ADMIXTURES**

**1021.01 General.** Admixtures shall be furnished in liquid form ready for use. The admixtures may be delivered in the manufacturer's original containers, bulk tank trucks or such containers or tanks as are acceptable to the Engineer. Delivery shall be accompanied by a ticket which clearly identifies the manufacturer and trade name of the material. In all cases, containers shall be readily identifiable to the satisfaction of the Engineer as to manufacturer and trade name of the material they contain.

Prior to inclusion of a product on the Department's Approved List of Concrete Admixtures, the manufacturer shall submit a report prepared by an independent laboratory accredited by the AASHTO Accreditation Program. The report shall show the results of physical tests conducted no more than five years prior to the time of submittal, according to applicable specifications.

Tests shall be conducted using materials and methods specified on a "test" concrete and a "reference" concrete, together with a certification that no changes have been made in the formulation of the material since the performance of the tests. The report shall also include water contents and results of set time tests according to AASHTO T 197 that were conducted on both a test and reference concrete, using cement from the source that is used as a standard by the Bureau of Materials and Physical Research. The cement content for all required tests shall either be according to applicable specifications or 335 kg/cu m (5.65 cwt/cu yd). Compressive strength test results for six months and one year will not be required.

Prior to the approval of an admixture, the Engineer may conduct all or part of the applicable tests on a sample that is representative of the material to be furnished. The test and reference concrete mixtures tested by the Engineer will contain a cement content of 335 kg/cu m (5.65 cwt/cu yd).

The manufacturer shall submit certification, both initially and annually thereafter, giving the following information according to ASTM C 494; the average and manufacturing range of specific gravity, the average and manufacturing range of solids in the solution, and the average and manufacturing range of pH. The initial and annual certifications shall further state that all admixtures, except chloride-based accelerators, shall contain no more than 0.3 percent chloride by mass. The initial submittal shall also include an infrared spectrophotometer trace no more than five years old.

Annual re-submittals will be required and shall include certification that no changes have been made in the formulation since it was initially approved. The certification shall state that the admixture is the same as previously approved, and the Engineer may conduct such tests as deemed desirable to check the properties of the material before re-approval is granted.

When test results are more than seven years old, the manufacturer shall re-submit the infrared spectrophotometer trace and the report prepared by an independent laboratory that is accredited by AASHTO Accreditation Program.

**1021.02 Air-Entraining Admixtures.** Air-entraining admixtures shall conform to the requirements of AASHTO M 154.



If the manufacturer certifies that the air-entraining admixture is an aqueous solution of Vinsol resin that has been neutralized with sodium hydroxide (caustic soda), testing for compliance with the requirements may be waived by the Engineer. In the certification, the manufacturer shall show complete information with respect to the formulation of the solution, including the number of parts of Vinsol resin to each part of sodium hydroxide. Before the approval of its use is granted, the Engineer will test the solution for its air-entraining quality in comparison with a solution prepared and kept for that purpose.

**1021.03 Retarding and Water-Reducing Admixtures.** The admixture shall comply with the following requirements:

- (a) The retarding admixture shall comply with the requirements of AASHTO M 194, Type B (retarding) or Type D (water-reducing and retarding).
- (b) The water-reducing admixture shall comply with the requirements of AASHTO M 194, Type A.
- (c) The high range water-reducing admixture shall comply with the requirements of AASHTO M 194, Type F (high range water-reducing) or Type G (high range water-reducing and retarding).

When a Type F or Type G high range water-reducing admixture is used, water-cement ratios shall be a minimum of 0.32.

Type F or Type G admixtures may be used, subject to the following restrictions:

For Class MS, SI, RR, SC and SH concrete, the water-cement ratio shall be a maximum of 0.44.

The Type F or Type G admixture shall be added at the jobsite unless otherwise directed by the Engineer. The initial slump shall be a minimum of 40 mm (1 1/2 in.) prior to addition of the Type F or Type G admixture, except as approved by the Engineer.

When a Type F or Type G admixture is used, retempering with water or with a Type G admixture will not be allowed. An additional dosage of a Type F admixture, not to exceed 40 percent of the original dosage, may be used to retemper concrete once, provided set time is not unduly affected. A second retempering with a Type F admixture may be used for all classes of concrete except Class PP and SC, provided that the dosage does not exceed the dosage used for the first retempering, and provided that the set time is not unduly affected. No further retempering will be allowed.

Air tests shall be performed after the addition of the Type F or Type G admixture.

**1021.04 Set Accelerating Admixtures.** The admixture shall comply with the requirements of AASHTO M 194, Type C (accelerating) or Type E (water reducing and accelerating)"

**Portland Cement Concrete**

Effective: November 1, 2002

Add the following paragraph after the fourth paragraph of Article 1103.01(b) of the Standard Specifications:

"The truck mixer shall be approved before use according to the Bureau of Materials and Physical Research's Policy Memorandum, "Approval of Concrete Plants and Delivery Trucks"."

Add the following paragraph after the first paragraph of Article 1103.01(c) of the Standard Specifications:

"The truck agitator shall be approved before use according to the Bureau of Materials and Physical Research's Policy Memorandum, "Approval of Concrete Plants and Delivery Trucks"."

Add the following paragraph after the first paragraph of Article 1103.01(d) of the Standard Specifications:

"The nonagitator truck shall be approved before use according to the Bureau of Materials and Physical Research's Policy Memorandum, "Approval of Concrete Plants and Delivery Trucks"."

Revise the first sentence of the first paragraph of Article 1103.02 of the Standard Specifications to read:

"The plant shall be approved before production begins according to the Bureau of Materials and Physical Research's Policy Memorandum, "Approval of Concrete Plants and Delivery Trucks"."

## Curing and Protection of Concrete Construction

Effective: January 1, 2004

Revise the second and third sentences of the eleventh paragraph of Article 503.06 of the Standard Specifications to read:

"Forms on substructure units shall remain in place at least 24 hours. The method of form removal shall not result in damage to the concrete."

Delete the twentieth paragraph of Article 503.22 of the Standard Specifications.

Revise the "Unit Price Adjustments" table of Article 503.22 of the Standard Specifications to read:

"UNIT PRICE ADJUSTMENTS"	
Type of Construction	Percent Adjustment in Unit Price
For concrete in substructures, culverts (having a waterway opening of more than 1 sq m (10 sq ft)), pump houses, and retaining walls (except concrete pilings, footings and foundation seals):	
When protected by:	
Protection Method II	115%
Protection Method I	110%
For concrete in superstructures:	
When protected by:	
Protection Method II	123%
Protection Method I	115%
For concrete in footings:	
When protected by:	
Protection Method I, II or III	107%
For concrete in slope walls:	
When protected by:	
Protection Method I	107%

Delete the fourth paragraph of Article 504.05(a) of the Standard Specifications.

Revise the second and third sentences of the fifth paragraph of Article 504.05(a) of the Standard Specifications to read:

"All test specimens shall be cured with the units according to Article 1020.13."

Revise the first paragraph of Article 504.06(c)(6) of the Standard Specifications to read:

"Curing and Low Air Temperature Protection. The curing and protection for precast, prestressed concrete members shall be according to Article 1020.13 and this Article."

Revise the first sentence of the second paragraph of Article 504.06(c)(6) of the Standard Specifications to read:

"For curing, air vents shall be in place, and shall be so arranged that no water can enter the void tubes during the curing of the members."

Revise the first sentence of the third paragraph of Article 504.06(c)(6) of the Standard Specifications to read:

"As soon as each member is finished, the concrete shall be covered with curing material according to Article 1020.13."

Revise the eighth paragraph of Article 504.06(c)(6) of the Standard Specifications to read:

"The prestressing force shall not be transferred to any member before the concrete has attained the compressive strength of 28,000 kPa (4000 psi) or other higher compressive release strength specified on the plans, as determined from tests of 150 mm (6 in.) by 300 mm (12 in.) cylinders cured with the member according to Article 1020.13. Members shall not be shipped until 28-day strengths have been attained and members have a yard age of at least 4 days."

Delete the third paragraph of Article 512.03(a) of the Standard Specifications.

Delete the last sentence of the second paragraph of Article 512.04(d) of the Standard Specifications.

Revise the "Index Table of Curing and Protection of Concrete Construction" table of Article 1020.13 of the Standard Specifications to read:

"INDEX TABLE OF CURING AND PROTECTION OF CONCRETE CONSTRUCTION"			
TYPE OF CONSTRUCTION	CURING METHODS	CURING PERIOD DAYS	LOW AIR TEMPERATURE PROTECTION METHODS
<b>Cast-In-Place Concrete:</b> <sup>11/</sup>			
Pavement			
Shoulder	1020.13(a)(1)(2)(3)(4)(5) <sup>3/ 5/</sup>	3	1020.13(c)
Base Course			
Base Course Widening	1020.13(a)(1)(2)(3)(4)(5) <sup>1/ 2/</sup>	3	1020.13(c)
Driveway			
Median			
Curb			
Gutter	1020.13(a)(1)(2)(3)(4)(5) <sup>4/ 5/</sup>	3	1020.13(c) <sup>16/</sup>
Curb and Gutter			
Sidewalk			
Slope Wall			
Paved Ditch			
Catch Basin			
Manhole	1020.13(a)(1)(2)(3)(4)(5) <sup>4/</sup>	3	1020.13(c)
Inlet			
Valve Vault			
Pavement Patching	1020.13(a)(1)(2)(3)(4)(5) <sup>2/</sup>	3 <sup>12/</sup>	1020.13(c)
Pavement Replacement	1020.13(a)(1)(2)(3)(4)(5) <sup>1/ 2/</sup>	3	442.06(h) and 1020.13(c)
Railroad Crossing	1020.13(a)(3)(5)	1	1020.13(c)
Piles	1020.13(a)(3)(5)	7	1020.13(e)(1)(2)(3)
Footings			
Foundation Seals	1020.13(a)(1)(2)(3)(4)(5) <sup>4/6/</sup>	7	1020.13(e)(1)(2)(3)
Substructure	1020.13(a)(1)(2)(3)(4)(5) <sup>17/</sup>	7	1020.13(e)(1)(2)(3)
Superstructure (except deck)	1020.13(a)(1)(2)(3)(5) <sup>8/</sup>	7	1020.13(e)(1)(2)
Deck	1020.13(a)(5)	7	1020.13(e)(1)(2) <sup>17/</sup>
Retaining Walls	1020.13(a)(1)(2)(3)(4)(5) <sup>17/</sup>	7	1020.13(e)(1)(2)
Pump Houses	1020.13(a)(1)(2)(3)(4)(5) <sup>1/</sup>	7	1020.13(e)(1)(2)
Culverts	1020.13(a)(1)(2)(3)(4)(5) <sup>4/6/</sup>	7	1020.13(e)(1)(2) <sup>18/</sup>
Other Incidental Concrete	1020.13(a)(1)(2)(3)(5)	3	1020.13(c)
<b>Precast Concrete:</b> <sup>11/</sup>			
Bridge Beams			
Piles			
Bridge Slabs	1020.13(a)(3)(5) <sup>9/10/</sup>	As required. <sup>13/</sup>	504.06(c)(6), 1020.13(e)(2) <sup>19/</sup>
Nelson Type Structural Member			
All Other Precast Items	1020.13(a)(3)(4)(5) <sup>2/9/10/</sup>	As required. <sup>14/</sup>	504.06(c)(6), 1020.13(e)(2) <sup>18/</sup>
<b>Precast, Prestressed Concrete:</b> <sup>11/</sup>			
All Items	1020.13(a)(3)(5) <sup>9/10/</sup>	Until strand tensioning is released. <sup>15/</sup>	504.06(c)(6), 1020.13(e)(2) <sup>19/</sup>

Notes-General:

- 1/ Type I, membrane curing only
- 2/ Type II, membrane curing only
- 3/ Type III, membrane curing only
- 4/ Type I, II and III membrane curing
- 5/ Membrane curing will not be permitted between November 1 and April 15.
- 6/ The use of water to inundate footings, foundation seals or the bottom slab of culverts is permissible when approved by the Engineer, provided the water temperature can be maintained at 7 °C ( 45 °F) or higher.
- 7/ Asphalt Emulsion for Waterproofing may be used in lieu of other curing methods when specified and permitted according to Article 503.18.
- 8/ On non-traffic surfaces which receive protective coat according to Article 503.19, a linseed oil emulsion curing compound may be used as a substitute for protective coat and other curing methods. The linseed emulsion curing compound will be permitted between April 16 and October 31 of the same year, provided it is applied with a mechanical sprayer according to Article 1101.09 (b), and meets the material requirements of Article 1022.07.
- 9/ Steam curing (heat and moisture) is acceptable and shall be accomplished by the method specified in Article 504.06(c)(6).
- 10/ A moist room according to AASHTO M 201 is acceptable for curing.
- 11/ If curing is required and interrupted because of form removal for cast-in-place concrete items, precast concrete products, or precast prestressed concrete products, the curing shall be resumed within two hours from the start of the form removal.
- 12/ Curing maintained only until opening strength is attained, with a maximum curing period of three days.
- 13/ The curing period shall end when the concrete has attained the mix design strength. The producer has the option to discontinue curing when the concrete has attained 80 percent of the mix design strength or after seven days. All strength test specimens shall remain with the units and shall be subjected to the same curing method and environmental condition as the units, until the time of testing.
- 14/ The producer shall determine the curing period or may elect to not cure the product. All strength test specimens shall remain with the units and shall be subjected to the same curing method and environmental condition as the units, until the time of testing.
- 15/ The producer has the option to continue curing after strand release.
- 16/ When structural steel or structural concrete is in place above slope wall, Article 1020.13(c) shall not apply. The protection method shall be according to Article 1020.13(e)(1).
- 17/ When Article 1020.13(e)(2) is used to protect the deck, the housing may enclose only the bottom and sides. The top surface shall be protected according to Article 1020.13(e)(1).
- 18/ For culverts having a waterway opening of 1 sq m (10 sq ft) or less, the culverts may be protected according to Article 1020.13(e)(3).
- 19/ The seven day protection period in the first paragraph of Article 1020.13(e)(2) shall not apply. The protection period shall end when curing is finished. For the third paragraph of Article 1020.13(e)(2), the decrease in temperature shall be according to Article 504.06(c)(6)."

Add the following to Article 1020.13(a) of the Standard Specifications:

- "(5) Wetted Cotton Mat Method. After the surface of concrete has been textured or finished, it shall be covered immediately with dry cotton mats. The cotton mats shall be placed in a manner which will not mar the concrete surface. A texture resulting from the cotton mat material is acceptable. The cotton mats shall then be wetted immediately and thoroughly

soaked with a gentle spray of water. For bridge decks, a foot bridge shall be used to place and wet the cotton mats.

The cotton mats shall be maintained in a wetted condition until the concrete has hardened sufficiently to place soaker hoses without marring the concrete surface. The soaker hoses shall be placed on top of the cotton mats at a maximum 1.2 m (4 ft) spacing. The cotton mats shall be kept wet with a continuous supply of water for the remainder of the curing period. Other continuous wetting systems may be used if approved by the Engineer.

After placement of the soaker hoses, the cotton mats shall be covered with white polyethylene sheeting or burlap-polyethylene blankets.

For construction items other than bridge decks, soaker hoses or a continuous wetting system will not be required if the alternative method keeps the cotton mats wet. Periodic wetting of the cotton mats is acceptable.

For areas inaccessible to the cotton mats on bridge decks, curing shall be according to Article 1020.13(a)(3)."

Revise the first paragraph of Article 1020.13(c) of the Standard Specifications to read:

"Protection of Portland Cement Concrete, Other Than Structures, From Low Air Temperatures. When the official National Weather Service forecast for the construction area predicts a low of 0 °C (32 °F), or lower, or if the actual temperature drops to 0 °C (32 °F), or lower, concrete less than 72 hours old shall be provided at least the following protection:"

Delete Article 1020.13(d) and Articles 1020.13(d)(1),(2),(3),(4) of the Standard Specifications.

Revise the first five paragraphs of Article 1020.13(e) of the Standard Specifications to read:

"Protection of Portland Cement Concrete Structures From Low Air Temperatures. When the official National Weather Service Forecast for the construction area predicts a low below 7 °C (45 °F), or if the actual temperature drops below 7 °C (45 °F), concrete less than 72 hours old shall be provided protection. Concrete shall also be provided protection when placed during the winter period of December 1 through March 15. Concrete shall not be placed until the materials, facilities and equipment for protection are approved by the Engineer.

When directed by the Engineer, the Contractor may be required to place concrete during the winter period. If winter construction is specified, the Contractor shall proceed with the construction, including concrete, excavation, pile driving, steel erection and all appurtenant work required for the complete construction of the item, except at times when weather conditions make such operations impracticable.

Regardless of the precautions taken, the Contractor shall be responsible for protection of the concrete placed and any concrete damaged by cold temperatures shall be removed and replaced by the Contractor at his/her own expense."

Add the following at the end of the third paragraph of Article 1020.13(e)(1) of the Standard Specifications:

"The Contractor shall provide means for checking the temperature of the surface of the concrete during the protection period."

Revise the second sentence of the first paragraph of Article 1020.13(e)(2) of the Standard Specifications to read:

"The Contractor shall provide means for checking the temperature of the surface of the concrete or air temperature within the housing during the protection period."

Delete the last sentence of the first paragraph of Article 1020.13(e)(3) of the Standard Specifications.

Add the following Article to Section 1022 of the Standard Specifications:

**"1022.06 Cotton Mats.** Cotton mats shall consist of a cotton fill material, minimum 400 g/sq m (11.8 oz/sq yd), covered with unsized cloth or burlap, minimum 200 g/sq m (5.9 oz/sq yd), and be tufted or stitched to maintain stability.

Cotton mats shall be in a condition satisfactory to the Engineer. Any tears or holes in the mats shall be repaired.

Add the following Article to Section 1022 of the Standard Specifications:

**"1022.07 Linseed Oil Emulsion Curing Compound.** Linseed oil emulsion curing compound shall be composed of a blend of boiled linseed oil and high viscosity, heavy bodied linseed oil emulsified in a water solution. The curing compound shall meet the requirements of a Type I, II, or III according to Article 1022.01, except the drying time requirement will be waived. The oil phase shall be  $50 \pm 4$  percent by volume. The oil phase shall consist of 80 percent by mass (weight) boiled linseed oil and 20 percent by mass (weight) Z-8 viscosity linseed oil. The water phase shall be  $50 \pm 4$  percent by volume."

Revise Article 1020.14 of the Standard Specifications to read:

**"1020.14 Temperature Control for Placement.** Temperature control for concrete placement shall conform to the following requirements:

- (a) **Temperature Control other than Structures.** The temperature of concrete immediately before placing, shall be not less than 10 °C (50 °F) nor more than 32 °C (90 °F). Aggregates and/or water shall be heated or cooled as necessary to produce concrete within these temperature limits.

When the temperature of the plastic concrete reaches 30 °C (85 °F), an approved retarding admixture shall be used or the approved water reducing admixture in use shall have its dosage increased by 50 percent over the dosage recommended on the Department's Approved List of Concrete Admixtures for the temperature experienced. The amount of retarding admixture to be used will be determined by the Engineer. This requirement may be waived by the Engineer when fly ash compensated mixtures are used.

Plastic concrete temperatures up to 35 °C (96 °F), as placed, may be permitted provided job site conditions permit placement and finishing without excessive use of water on and/or overworking of the surface. The occurrence within 24 hours of unusual surface distress shall be cause to revert to a maximum 32 °C (90 °F) plastic concrete temperature.

Concrete shall not be placed when the air temperature is below 5 °C (40 °F) and falling or below 2 °C (35 °F), without permission of the Engineer. When placing of concrete is authorized during cold weather, the Engineer may require the water and/or the aggregates to be heated to not less than 20 °C (70 °F) nor more than 65 °C (150 °F). The aggregates may be heated by either



steam or dry heat prior to being placed in the mixer. The apparatus used shall heat the mass uniformly and shall be so arranged as to preclude the possible occurrence of overheated areas which might damage the materials. No frozen aggregates shall be used in the concrete.

For pavement patching, refer to Article 442.06(e) for additional information on temperature control for placement.

- (b) Temperature Control for Structures. The temperature of concrete as placed in the forms shall be not less than 10 °C (50 °F) nor more than 32 °C (90 °F). Aggregates and/or water shall be heated or cooled as necessary to produce concrete within these temperature limits. When insulated forms are used, the temperature of the concrete mixture shall not exceed 25 °C (80 °F). If the Engineer determines that heat of hydration might cause excessive temperatures in the concrete, the concrete shall be placed at a temperature between 10 °C (50 °F) and 15 °C (60 °F), per the Engineer's instructions. When concrete is placed in contact with previously placed concrete, the temperature of the concrete may be increased as required to offset anticipated heat loss.

Concrete shall not be placed when the air temperature is below 7 °C (45 °F) and falling or below 4 °C (40 °F), without permission of the Engineer. When placing of concrete is authorized during cold weather, the Engineer may require the water and/or the aggregates to be heated to not less than 20 °C (70 °F) nor more than 65 °C (150 °F). The aggregates may be heated by either steam or dry heat prior to being placed in the mixer. The apparatus used shall heat the mass uniformly and shall be so arranged as to preclude the possible occurrence of overheated areas which might damage the materials. No frozen aggregates shall be used in the concrete.

When the temperature of the plastic concrete reaches 30 °C (85 °F), an approved retarding admixture shall be used or the approved water reducing admixture in use shall have its dosage increased by 50 percent over the dosage recommended on the Department's Approved List of Concrete Admixtures for the temperature experienced. The amount of retarding admixture to be used will be determined by the Engineer. This requirement may be waived by the Engineer when fly ash compensated mixtures are used.

- (c) Temperature. The concrete temperature shall be determined according to ASTM C 1064."

## **Personal Protective Equipment**

Effective: July 1, 2004

All personnel, excluding flaggers, working outside of a vehicle (car or truck) within 7.6 m (25 ft) of pavement open to traffic shall wear a fluorescent orange, fluorescent yellow/green or a combination of fluorescent orange and fluorescent yellow/green vest meeting the requirements of the American National Standards Institute specification ANSI/ISEA 107-1999 for Conspicuity Class 2 garments. Other types of garments may be substituted for the vest as long as the garments have manufacturers tags identifying them as meeting the ANSI Class 2 requirement.

## **Work Zone Traffic Control**

Effective: April 2, 2004

Revise the first paragraph of Article 701.07(b) to read:

- "(b) Standards 701401 and 701422 will be measured for payment on an each basis only when the traffic control and protection applies to isolated stationary work areas and does not involve or is a part of other protected areas."

Revise the Article 701.07(c) to read:

- "(c) Measured As Lump Sum. Traffic control and protection required under Standards 701201, 701206, 701306, 701326, 701336, 701400, 701406, 701421, 701501, 701502, 701601, 701602, 701606, 701701 and 701801 will be measured for payment on a lump sum basis. Traffic control protection required under Standards 701401 and 701422 will be measured for payment on a lump sum basis, except as specified under Article 701.07(b). Where the Contractor's operations result in daily changing, or two or more work areas each of which requires traffic control according to one of the above Standards, each work area installation will not be paid for separately, but shall be included in the lump sum price for the type of protection furnished."

Revise the first paragraph of Article 701.08(a) to read:

- "(a) Traffic control and protection will be paid for at the contract unit price each for TRAFFIC CONTROL AND PROTECTION STANDARD 701316; TRAFFIC CONTROL AND PROTECTION STANDARD 701321; TRAFFIC CONTROL AND PROTECTION STANDARD 701331; TRAFFIC CONTROL AND PROTECTION STANDARD 701401; TRAFFIC CONTROL AND PROTECTION STANDARD 701402; TRAFFIC CONTROL AND PROTECTION STANDARD 701411; TRAFFIC CONTROL AND PROTECTION STANDARD 701416; TRAFFIC CONTROL AND PROTECTION STANDARD 701422; TRAFFIC CONTROL AND PROTECTION STANDARD 701423; or TRAFFIC CONTROL AND PROTECTION STANDARD 701431 at the location specified."

Revise the first paragraph of Article 701.08(b) to read:

- "(b) Traffic control and protection indicated in Article 701.07(c) will be paid for at the contract lump sum price for TRAFFIC CONTROL AND PROTECTION STANDARD 701201; TRAFFIC CONTROL AND PROTECTION STANDARD 701206; TRAFFIC CONTROL AND PROTECTION STANDARD 701306; TRAFFIC CONTROL AND PROTECTION STANDARD 701326; TRAFFIC CONTROL AND PROTECTION STANDARD 701336; TRAFFIC CONTROL AND PROTECTION STANDARD 701400; TRAFFIC CONTROL AND PROTECTION STANDARD 701401; TRAFFIC CONTROL AND PROTECTION STANDARD 701406; TRAFFIC CONTROL AND PROTECTION STANDARD 701421; TRAFFIC CONTROL AND PROTECTION STANDARD 701422; TRAFFIC CONTROL AND PROTECTION STANDARD 701501; TRAFFIC CONTROL AND PROTECTION STANDARD 701502; TRAFFIC CONTROL AND PROTECTION STANDARD 701601; TRAFFIC CONTROL AND PROTECTION STANDARD 701602; TRAFFIC CONTROL AND PROTECTION STANDARD 701606; TRAFFIC CONTROL AND PROTECTION STANDARD 701701; or TRAFFIC CONTROL AND PROTECTION STANDARD 701801."

## **DRILLED SHAFTS**

Effective: May 1, 2001

Revised: June 21, 2004

Description. This work shall consist of all labor, materials, equipment and services necessary to complete the drilled shaft installation according to the details and dimensions shown on the plans, this specification and as directed by the Engineer.

Submittals. The Contractor shall submit the following:

(a) Qualifications. At the time of the preconstruction conference, the Contractor shall provide the following documentation:

- (1) A list containing at least 3 projects completed within the 3 years prior to this project's bid date which the Contractor performing this work has installed drilled shafts of similar diameter, length and site conditions to those shown in the plans. The list of projects shall contain names and phone numbers of owner's representatives who can verify the Contractor's participation on those projects.
- (2) Name and experience record of the drilled shaft supervisor, responsible for all facets of the shaft installation, and the drill operator(s) who will be assigned to this project. The supervisor and driller shall each have a minimum of 3 years experience in the construction of drilled shafts.
- (3) A signed statement that the drilled shaft supervisor has inspected both the project site and all the subsurface information available. In addition to the subsurface information in the contract documents, rock core specimens and/or geotechnical reports, when available, should be requested for evaluation.

(b) Installation Procedure. A submittal detailing the installation procedure will be required for all drilled shafts, unless directed otherwise by the Engineer. The Contractor, meeting the above qualifications, shall prepare the installation procedure, addressing all items shown below and will be responsible for directing all aspects of the shaft construction. The installation procedure shall be submitted to the Engineer at least 45 days prior to drilled shaft construction and shall address each of the following items:

- (1) List of proposed equipment to be used including cranes, drill rigs, augers, belling tools, casing, core barrels, bailing buckets, final cleaning equipment, slurry equipment, tremies or concrete pumps, etc.
- (2) Details of the overall construction operation sequence, equipment access, and the sequence of individual shaft construction within each substructure bent or footing group. The submittal shall address the Contractor's proposed time delay and/or the minimum concrete strength necessary before initiating a shaft excavation adjacent to a recently installed drilled shaft.

- (3) A step by step description of how the Contractor anticipates the shaft excavation to be advanced based on their evaluation of the subsurface data and conditions expected to be encountered. This sequence shall note the method of casing advancement, anticipated casing lengths, tip elevations and diameters, the excavation tools used and drilled diameters created. The Contractor shall indicate whether wet or dry drilling conditions are expected or if the water table will be sealed from the excavation.
- (4) When slurry is proposed, details covering the measurement and control of the hardness of the mixing water, agitation, circulation, de-sanding, sampling, testing and chemical properties of the slurry shall be submitted.
- (5) Method(s) and sequence proposed for the shaft cleaning operation as well as recommendations on how the shaft excavation will be inspected under the installation conditions anticipated.
- (6) Details of reinforcement placement including cage centralization devices to be used and method to maintain proper elevation and plan location of cage within the shaft excavation during concrete placement. The method(s) of adjusting the cage length if rock is encountered at an elevation other than as estimated in the plans.
- (7) Details of concrete placement including proposed operational procedures for free fall, tremie or pumping methods. The sequence and method of casing removal shall also be stated along with the top of pour elevation, and method of forming through water above streambed.
- (8) The proposed concrete mix design(s).

The Engineer will evaluate the drilled shaft installation plan and notify the Contractor of acceptance, or if additional information is required, or if there are concerns with the installation's effect on the existing or proposed structure(s).

**Materials.** The materials used for the construction of the drilled shaft shall satisfy the following requirements:

- (a) The drilled shaft portland cement concrete shall be according to Section 1020, except the mix design shall be as follows:
  - (1) A Type I or II cement shall be used at 395 kg/cu m (665 lb/cu yd). When specified in the plans that soil and ground water sulfate contaminates exceed 500 parts per million, a Type V cement shall be required.
  - (2) Class C or F fly ash may replace Type I or II cement. The cement replacement shall not exceed 15 percent by mass (weight) at a minimum replacement ratio of 1.5:1. The fly ash shall not be used in combination with ground granulated blast- furnace slag.

- (3) Grade 100 or 120 ground granulated blast-furnace slag may replace Type I or II cement. The cement replacement shall not exceed 25 percent by mass (weight) at a minimum replacement ratio of 1:1. The ground granulated blast-furnace slag shall not be used in combination with fly ash.
- (4) The maximum water/cement ratio shall be 0.44.
- (5) The mortar factor shall be a value which produces a coarse aggregate content comprising between 55 and 65 percent of total aggregate by mass (weight).
- (6) The slump at point of placement shall be  $175 \text{ mm} \pm 25 \text{ mm}$  ( $7 \pm 1 \text{ in.}$ ). If concrete is placed to displace drilling fluid, or against temporary casing, the slump shall be  $200 \text{ mm} \pm 25 \text{ mm}$  ( $8 \pm 1 \text{ in.}$ ) at point of placement. The concrete mix shall be designed to remain fluid throughout the anticipated duration of the pour plus 1 hour.
- (7) An air entraining admixture shall be required and the air content range shall be 4.0 to 7.0 percent.
- (8) The minimum compressive strength shall be 27,500 kPa (4000 psi) at 14 days. The minimum flexural strength shall be 4,650 kPa (675 psi) at 14 days.
- (9) A retarding admixture shall be required.
- (10) A water-reducing or high range water-reducing admixture shall be required.
- (11) An accelerating admixture may be used with the permission of the Engineer in extraordinary situations.
- (12) The coarse aggregate shall be a CA 13, CA 14, CA 16 or a blend of these gradations. The fine aggregate shall consist of washed sand only.

At the Engineers discretion, and at no additional cost to the Department, the Contractor may be required to conduct a minimum 0.76 cu m (1 cu yd) trial batch to verify the mix design.

- (b) The sand-cement grout mix used to fill any visible gaps, which may exist between the permanent casing and either the drilled excavation or temporary casing, shall be as follows:
  - (1) A Type I or II cement shall be used at 110 kg/cu m (185 lb/cu yd). When specified in the plans that soil and ground water sulfate contaminants exceed 500 parts per million, a Type V cement shall be required. The cement shall be according to Section 1001.
  - (2) The fine aggregate shall be according to Articles 1003.01 and 1003.02.
  - (3) The water shall be according to Section 1002.

- (4) The maximum water/cement ratio shall be 1.0.
- (c) Reinforcement shall be according to Section 508 of the Standard Specifications.
- (d) Drilling slurry, when required, shall consist of a polymer or mineral base material. Mineral slurry shall have both a mineral grain size that will remain in suspension with sufficient viscosity and gel characteristics to transport excavated material to a suitable screening system. The percentage and specific gravity of the material used to make the suspension shall be sufficient to maintain the stability of the excavation and to allow proper concrete placement. For polymer slurry, the calcium hardness of the mixing water shall not exceed 100 mg/L.
- (e) Permanent casing, when required, shall be fabricated from steel satisfying ASTM A252 Grade 2, produced by electric seam, butt, or spiral welding to satisfy the outside diameter(s) and lengths shown in the contract plans or as shown in the Contractor's installation procedure. The minimum wall thickness shall be as required to resist the anticipated installation and dewatering stresses, as determined by the Contractor, but in no case less than 6 mm (1/4 in.).

Equipment. The drilling equipment shall have adequate capacity, including power, torque and down thrust, to create a shaft excavation of the maximum diameter specified to a depth of 20 percent beyond the depths shown on the plans. Standby equipment of sufficient capacity shall be available so that there will be no delay in placing of the concrete once the operation has started. Concrete equipment shall be according to Article 1020.03 of the Standard Specifications.

Construction Requirements. Excavation for drilled shaft(s) shall not proceed until written authorization is received from the Engineer. The Contractor shall furnish an installation log for each shaft installed. Excavation by blasting shall not be permitted unless authorized in writing by the Engineer.

No shaft excavation shall be made within 4 shaft diameters center to center of a shaft with concrete that has a compressive strength less than 10,342 kPa (1500 psi) unless otherwise approved in the Contractor's installation procedure. The site-specific soil strengths and installation methods selected will determine the actual required minimum spacing, if any, to address vibration and blow out concerns.

Materials removed or generated from the shaft excavations shall be disposed of by the Contractor according to Article 202.03 of the Standard Specifications.

The Contractor's methods and equipment shall be suitable for the anticipated conditions and the following requirements noted below:

- (a) Construction Tolerances. The following construction tolerances shall apply to all drilled shafts unless otherwise stated in the contract documents:

- (1) The center of the drilled shaft shall be within 75 mm (3 in.) of the plan station and offset at the top of the shaft.
  - (2) The center of the reinforcement cage shall be within 38 mm (1 1/2 in.) of plan station and offset at the top of the shaft.
  - (3) The out of vertical plumbness of the shaft shall not exceed 1.5 percent.
  - (4) The out of vertical plumbness of the shaft reinforcement cage shall not exceed 0.83 percent.
  - (5) The top of the reinforcing steel cage shall be no more than 25 mm (1 in.) above and no more than 75 mm (3 in.) below the plan elevation.
  - (6) The top of the shaft shall be no more than 25 mm (1 in.) above and no more than 75 mm (3 in.) below the plan elevation.
  - (7) Excavation equipment and methods used to complete the shaft excavation shall have a nearly planar bottom. The cutting edges of excavation equipment used to create the bottom of shafts in rock shall be normal to the vertical axis of the shaft within a tolerance of 6.25 percent.
- (b) Construction Methods. The construction of drilled shafts may involve the use of one or more of the following methods to support the excavation during the various phases of shaft drilling, cleaning and concrete placement dependent on the site conditions encountered. The following are general descriptions indicating the conditions when these methods may be used:
- (1) Dry Method. The dry method consists of drilling the shaft excavation, removing accumulated water and loose material from the excavation, placing the reinforcing cage, and concrete in a predominately dry excavation. This method shall be used only at sites where the groundwater and soil conditions are suitable to permit the drilling and dewatering of the excavation without causing excessive water infiltration, boiling, squeezing, or caving of the shaft side walls. This method allows the concrete placement by tremie or concrete pumps, or if the excavation can be dewatered, the concrete can be placed by free fall within the limits specified for concrete placement.
  - (2) Wet Method. The wet construction method may be used at sites where dewatering the excavation would cause collapse of the shaft sidewalls or when the volume and head of water flowing into the shaft is likely to contaminate the concrete during placement resulting in a shaft defect. This method uses water or slurry to maintain stability of the shaft perimeter while advancing the excavation. After the excavation is completed, the water level in the shaft is allowed to seek equilibrium, the base is cleaned, the reinforcing cage is set and the concrete is discharged at the base using a tremie pipe or concrete pump, displacing the drilling fluid upwards.



- (3) Temporary Casing Method. Temporary casing shall be used when either the wet or dry methods provide inadequate support to prevent sidewall caving or ensure excessive deformation of the hole. Temporary casing may also be used to reduce the flow of water into the excavation to allow dewatering, adequate cleaning and inspection, or to insure proper concrete placement. Temporary casing left in place may constitute a shaft defect; no temporary casing will be allowed to remain permanently in place without the specific approval of the Engineer.

Before the temporary casing is broken loose, the level of concrete in the casing shall be a minimum of 1.5 m (5 ft) above the bottom of the casing. After being broken loose and as the casing is withdrawn, additional concrete shall be added to maintain sufficient head so that water and soil trapped behind the casing can be displaced upward and discharged at the ground surface without contaminating the concrete in the shaft or at the finished construction joint.

- (4) Permanent Casing Method. When called for on the plans or proposed as part of the Contractor's accepted installation procedure, the Contractor shall install a permanent casing of the diameter, length, thickness and strength specified. When permanent casings are used, the lateral loading design requires intimate contact between the casing and the surrounding soils. If the installation procedure used to set the permanent casing results in annular voids between the permanent casing and the drilled excavation, the voids shall be filled with a sand-cement grout to maintain the lateral load capacity of the surrounding soil, as assumed in the design. No permanent casing will be allowed to remain in place beyond the limits shown on the plans without the specific approval of the Engineer.
- (5) Removable Forms. When the shaft extends above streambed through a body of water and permanent casing is not shown, the portion above the streambed shall be formed with removable casings, column forms, or other forming systems as approved by the Engineer. The forming system shall not scar or spall the finished concrete or leave in place any forms or casing within the removable form limits as shown on the plans unless approved as part of the installation procedure. The forming system shall not be removed until the concrete has attained a minimum compressive strength of 17,237 kPa (2500 psi) and cured for a minimum of 72 hours. For shafts extending through water, the concrete shall be protected from water action after placement for a minimum of 7 days.
- (c) Slurry. If the Contractor proposes to use a method of slurry construction, it shall be submitted with the installation plan. During construction, the level of the slurry shall be maintained at a height sufficient to prevent caving of the hole. In the event of a sudden or significant loss of slurry to the hole, the construction of that foundation shall be stopped and the shaft excavation backfilled or supported by temporary casing, until a method to stop slurry loss, or an alternate construction procedure has been approved by the Engineer.

- (d) **Obstructions.** Obstructions shall be defined as any object (such as but not limited to, boulders, logs, old foundations etc.) that cannot be removed with normal earth drilling procedures but requires special augers, tooling, core barrels or rock augers to remove the obstruction. When obstructions are encountered, the Contractor shall notify the Engineer and upon concurrence of the Engineer, the Contractor shall begin working to core, break up, push aside, or remove the obstruction. Lost tools or equipment in the excavation as a result of the Contractor's operation shall not be defined as obstructions and shall be removed at the Contractor's expense.
- (e) **Top of Rock.** The actual top of rock will be defined as the point when material is encountered which can not be drilled with a conventional earth auger and/or underreaming tool, and requires the use of special rock augers, core barrels, air tools, blasting or other methods of hand excavation.
- (f) **Sidewall overreaming.** Sidewall overreaming shall be required when the sidewall of the hole is determined by the Engineer to have either softened due to the excavation methods, swelled due to delay in concreting, or degraded because of slurry cake buildup. It may also be required to correct a shaft excavation which has been drilled out of tolerance. Overreaming thickness shall be a minimum of 13 mm (1/2 in.). Overreaming may be accomplished with a grooving tool, overreaming bucket or other approved equipment. Any extra concrete needed as a result of the overreaming shall be furnished and installed at the Contractor's expense.
- (g) **Excavation Inspection.** The Contractor shall be responsible for verification of the dimensions and alignment of each shaft excavation as directed by the Engineer. Unless otherwise specified in the contract documents, the Contractor's cleaning operation shall be adjusted so that a minimum of 50 percent of the base of each shaft shall have less than 13 mm (1/2 in.) of sediment or debris at the time of placement of the concrete. The maximum depth of sediment or any debris at any place on the base of the shaft shall not exceed 38 mm (1 1/2 in.).
- Shaft cleanliness will be determined by the Contractor using the methods as submitted in their installation procedure. Visual inspection coupled with the use of a weighted tape may also be used to confirm adequate cleanliness.
- (h) **Design Modifications.** If the top of rock elevation differs from that shown on the plans by more than 10 percent of the length of the shaft above the rock, the Engineer shall be contacted to determine if any drilled shaft design changes may be required. In addition, if the type of soil or rock encountered is not similar to that shown in the subsurface exploration data, the Contractor may be required to extend the drilled shaft length(s) beyond those specified in the plans. In either case, the Engineer will determine if revisions are necessary and the extent of the modifications required.
- (i) **Reinforcement Cage Construction and Placement.** The shaft excavation shall be cleaned, inspected and accepted prior to placing the reinforcement cage. The reinforcement cage shall be completely assembled prior to drilling and be ready for adjustment in length as

required by the conditions encountered. The cage shall be lifted using multiple point sling straps or other approved methods to avoid cage distortion or stress. Additional cross frame stiffeners may also be required for lifting or to keep the cage in proper position during lifting and concrete placement.

The Contractor shall attach suitable centralizers to keep the cage away from the sides of the shaft excavation and ensure that at no point will the finished shaft have less than the minimum concrete cover(s) shown on the plans. The cage centralizers or other approved non-corrosive spacing devices shall be used at sufficient intervals (near the bottom and at intervals not exceeding 3 m (10 ft) throughout the length of the shaft) to ensure proper cage alignment and clearance for the entire shaft.

If the top of rock encountered is deeper than estimated in the plans, and/or if the conditions differ such that the length of the shaft is increased, additional longitudinal bars shall be either mechanically spliced or lap spliced to the lower end of the cage and confined with either hoop ties or spirals to provide the additional length. If the additional shaft length is less than the lap splice shown, subject to the approval of the Engineer, a mechanical splice may be used in lieu of the lap splice in order to take advantage of or utilize that lap length in the extension of the shaft reinforcement. The Contractor shall have additional reinforcement available or fabricate the cages with additional length as necessary to make the required adjustments in a timely manner as dictated by the encountered conditions. The additional reinforcement may be non-epoxy coated at the option of the Contractor. Any reinforcement fabricated in advance but not incorporated into the installed shaft(s) shall not be paid for but shall remain the property of the Contractor.

- (j) Concrete placement. Concrete work shall be performed according to the applicable portions of Section 503 of the Standard Specifications and as specified herein.

Concrete shall be placed as soon as possible after reinforcing steel is set and secured in proper position. The pour shall be made in a continuous manner from the bottom to the top elevation of the shaft as shown on the contract plan or as approved in the Contractor's installation procedure. Concrete placement shall continue after the shaft excavation is full and until good quality, uncontaminated concrete is evident at the top of shaft. The elapsed time from the beginning of concrete placement in the shaft to the completion of the placement shall not exceed 2 hours. The Contractor may request a longer placement time provided the concrete mix maintains the minimum slump requirements over the longer placement time as demonstrated by trial mix and slump loss tests. Concrete shall be placed either by free fall, or through a tremie or concrete pump subject to the following conditions:

- (1) The free fall placement shall only be permitted in shafts that can be dewatered to ensure less than 75 mm (3 in.) of standing water exist at the time of placement without causing side wall instability. The maximum height of free fall placement shall not exceed 18.3 m (60 ft). Concrete placed by free fall shall fall directly to the base without contacting either the rebar cage or hole sidewall. Drop chutes may be used to direct concrete to the base during free fall placement.

Drop chutes used to direct placement of free fall concrete shall consist of a smooth tube of either one continuous section or multiple pieces that can be added and removed. Concrete may be placed through either a hopper at the top of the tube or side openings as the drop chute is retrieved during concrete placement. The drop chute shall be supported so that the free fall does not exceed 18.3 m (60 ft) at all times and to ensure the concrete does not strike the rebar cage. If placement cannot be satisfactorily accomplished by free fall in the opinion of the Engineer, the Contractor shall use either tremie or pumping to accomplish the pour.

- (2) Tremies shall consist of a tube of sufficient length, weight, and diameter to discharge the initial concrete at the base of the shaft. The tremie shall be according to Article 503.08 of the Standard Specifications and contain no aluminum parts that may have contact with the concrete. The inside and outside surfaces of the tremie shall be clean and smooth to permit both flow of concrete and unimpeded withdrawal during concrete placement.
- (3) Concrete pumps: Pumps and lines may be used for concrete placement and shall have a minimum 100 mm (4 in.) diameter.

The tremie or pump lines used for wet method concrete placement shall be watertight and not begin discharge until placed within 250 mm (10 in.) of the shaft base. Valves, bottom plates or plugs may be used only when they can be removed from the excavation or be of a material approved by the Engineer that will not cause a defect in the shaft if not removed. The discharge end shall be immersed at least 1.5 m (5 ft) in concrete at all times after starting the pour. Sufficient concrete head shall be maintained in the tremie at all times to prevent water or slurry intrusion in the shaft concrete.

If at any time during the concrete pour in the "wet" hole, the tremie or pump line orifice is removed from the fluid concrete and discharges through drilling fluid or water above the rising concrete level, the shaft may be considered defective.

Vibration of concrete is not recommended when placed while displacing drilling fluid or water. In dry excavations, vibration is allowed only in the top 3 m (10 ft) of the shaft.

Conformity with Contract. In addition to Article 105.03, the Contractor shall be responsible for correcting all out of tolerance excavations and completed shafts as well as repairing any defects in the shaft to the satisfaction of the Engineer at no additional cost to the Department. No time extensions will be allowed to repair or replace unacceptable work. When a shaft excavation is completed with unacceptable tolerances, the Contractor will be required to submit for approval his/her proposed corrective measures. Any proposed design modification with computations submitted by the Contractor shall be signed and sealed by an Illinois licensed Structural Engineer.

Method of Measurement. The items Drilled Shaft in Soil and Drilled Shaft in Rock, will be measured for payment and the length computed in meters (feet) for all drilled shafts installed

according to the plans, specifications, and accepted by the Engineer. The length shall be measured at each shaft. The length in soil will be defined as the difference in elevation between the top of the drilled shaft shown on the plans, or as installed as part of the Contractor's installation procedure, and the bottom of the shaft or the top of rock (when present) whichever is higher. The length in rock will be defined as the difference in elevation between the measured top of rock and the bottom of the shaft. When permanent casing is installed as specified on the plans, it will be measured in meters (feet) and shall be the length of casing installed.

Basis of Payment. This work will be paid for at the contract unit price per meter (foot) for DRILLED SHAFT IN SOIL, and/or DRILLED SHAFT IN ROCK, of the diameter(s) specified. The price shall be payment in full for all labor, materials, equipment, and services necessary to complete the work as specified. When the shaft is detailed with a belled base, furnishing and installing it shall not be paid for separately but shall be included in the cost of the appropriate drilled shaft item(s).

When permanent casing is furnished and installed as specified, it will be paid for at the contract unit price per meter (foot) for PERMANENT CASING. Permanent casing installed at the Contractor's option shall not be included in this item, but shall be considered as included in the appropriate drilled shaft item(s) above.

Obstruction mitigation shall be paid for according to Article 109.04 of the Standard Specifications.

No additional compensation, other than noted above, will be allowed for removing and disposing of excavated materials, for furnishing and placing concrete, bracing, lining, temporary casings placed and removed or left in place, for grouting of any voids, or for any excavation made or concrete placed outside of the plan diameter(s) of the shaft(s) specified.

Reinforcement bars, spirals and ties shall be as specified and paid for under the items, REINFORCEMENT BARS or REINFORCEMENT BARS EPOXY COATED, according to Section 508 of the Standard Specifications.

## **CLEANING AND PAINTING NEW METAL STRUCTURES**

Effective Date: September 13, 1994

Revised Date: August 19, 2004

Description. The material and construction requirements that apply to cleaning and painting new structural steel shall be according to the applicable portion of Sections 506 of the Standard Specifications except as modified herein. The three coat paint system shall be the system as specified on the plans and as defined herein.

Materials. All materials to be used on an individual structure shall be produced by the same manufacturer. The Bureau of Materials and Physical Research has established a list of all products that have met preliminary requirements. Each batch of material must be tested and approved by that bureau before use.

The paint materials shall meet the requirements of the following articles of the Standard Specification:

<u>Item</u>	<u>Article</u>
(a) Inorganic Zinc-Rich Primer	1008.22
(b) Waterborne Acrylic	1008.24
(c) Aluminum Epoxy Mastic	1008.25
(d) Organic Zinc-Rich Primer (Note 1)	
(e) Epoxy Intermediate (Note 1)	
(f) Aliphatic Urethane (Note 1)	

Note 1: These material requirements shall be according to the Special Provision for the Organic Zinc-Rich Paint System.

Submittals. At least 30 days prior to beginning field painting, the Contractor shall submit for the Engineer's review and acceptance, the following applicable plans, certifications and information for completing the field work. Field painting can not proceed until the submittals are accepted by the Engineer. Qualifications, certifications and QC plans for shop cleaning and painting shall be available for review by the QA Inspector.

- a) Contractor/Personnel Qualifications. Except for miscellaneous steel items such as bearings, side retainers, expansion joint devices, and other items allowed by the Engineer, or unless stated otherwise in the contract, the shop painting Contractors shall be certified to perform the work as follows: the shop painting Contractor shall possess AISC Sophisticated Paint Endorsement or SSPC-QP3 certification. Evidence of current qualifications shall be provided.

Personnel managing the shop and field Quality Control program(s) for this work shall possess a minimum classification as a National Association of Corrosion Engineers (NACE) Coating Inspector Technician, or shall provide evidence of successful inspection of 3

projects of similar or greater complexity and scope that have been completed in the last 2 years. Copies of the certification and/or experience shall be provided.

The personnel performing the QC tests for this work shall be trained in coatings inspection and the use of the testing instruments. Documentation of training shall be provided.

- b) **Quality Control (QC) Program.** The shop and field QC Programs shall identify the following; the instrumentation that will be used, a schedule of required measurements and observations, procedures for correcting unacceptable work, and procedures for improving surface preparation and painting quality as a result of quality control findings. The field program shall incorporate the IDOT Quality Control Daily Report form, as supplied by the Engineer.
- c) **Field Cleaning and Painting Inspection Access Plan.** The inspection access plan for use by Contractor QC personnel for ongoing inspections and by the Engineer during Quality Assurance (QA) observations.
- d) **Surface Preparation/Painting Plan.** The surface preparation/painting plan shall include the methods of surface preparation and type of equipment to be utilized for solvent cleaning, abrasive blast cleaning, washing, and power tool cleaning. The plan shall include the manufacturer's names of the materials that will be used, including Product Data Sheets and Material Safety Data Sheets (MSDS).

A letter or written instructions from the coating manufacturer shall be included, indicating the required drying time for each coat at the minimum, normal, and maximum application temperatures before the coating can be exposed to temperatures or moisture conditions that are outside of the published application parameters.

**Field Quality Control (QC) Inspections.** The Contractor shall perform first line, in process QC inspections of each phase of the work. The Contractor shall implement the submitted and accepted QC Program to insure that the work accomplished complies with these specifications. The Contractor shall use the IDOT Quality Control Daily Report form supplied by the Engineer to record the results of quality control tests. The completed reports shall be turned into the Engineer before work resumes the following day.

The Contractor shall have available at the shop or on the field site, all of the necessary inspection and testing equipment. The equipment shall be available for the Engineer's use when requested.

**Field Quality Assurance (QA) Observations.** The Engineer will conduct QA observations of any or all phases of the work. The Engineer's observations in no way relieve the Contractor of the responsibility to provide all necessary daily QC inspections of his/her own and to comply with all requirements of this Specification.

The Engineer has the right to reject any work that was performed without adequate provision for QA observations.

The Engineer will issue a Non-Conformance Report when cleaning and painting work is found to be in violation of the specification requirements, and is not corrected to bring it into compliance before proceeding with the next phase of work.

**Inspection Access and Lighting.** The Contractor shall facilitate the Engineer's observations as required, including allowing ample time to view the work. The Contractor shall furnish, erect and move scaffolding or other mechanical equipment to permit close observation of all surfaces to be cleaned and painted. This equipment shall be provided during all phases of the work. Examples of acceptable access structures include:

- Mechanical lifting equipment, such as, scissor trucks, hydraulic booms, etc.
- Platforms suspended from the structure comprised of trusses or other stiff supporting members and including rails and kick boards.
- Simple catenary supports are permitted only if independent life lines for attaching a fall arrest system according to Occupational Safety and Health Administration (OSHA) regulations are provided.

When the surface to be inspected is more than 1.8 m (6 ft) above the ground or water surface, the Contractor shall provide the Engineer with a safety harness and a lifeline according to OSHA regulations. The lifeline and attachment shall not direct the fall into oncoming traffic. The Contractor shall provide a method of attaching the lifeline to the structure independent of the inspection facility or any support of the platform. When the inspection facility is more than 800 mm (2 1/2 ft) above the ground, the Contractor shall provide an approved means of access onto the platform.

The Contractor shall provide artificial lighting in areas where natural light is inadequate, as determined by the Engineer, to allow proper cleaning, inspection, and painting. Illumination for inspection shall be at least 325 LUX (30 foot candles). Illumination for cleaning and painting, including the working platforms, access, and entryways shall be at least 215 LUX (20 foot candles).

**Construction Requirements.** The Contractor shall be responsible for any damage caused to persons, vehicles, or property, except as indemnified by the Response Action Contractor Indemnification Act. Whenever the intended purposes of the protective devices are not being accomplished, as determined by the Engineer, work shall be immediately suspended until corrections are made. Painted surfaces damaged by any Contractor's operation shall be removed and repainted, as directed by the Engineer, at the Contractor's expense.

The Contractor shall comply with the provisions of the Illinois Environmental Protection Act. Paint drips, spills, and overspray are not permitted to escape into the air or onto any other surfaces or surrounding property not intended to be painted. Containment shall be used to control paint drips, spills, and overspray, and shall be dropped and all equipment secured when sustained wind speeds of 64 kph (40 mph) or greater occur, unless the containment design necessitates action at lower wind speeds. The contractor shall evaluate project-specific conditions to determine the specific type and extent of containment needed to control the paint



emissions and shall submit a plan for containing or controlling paint debris (droplets, spills, overspray, etc.) to the Engineer for approval prior to starting the work. Approval shall not relieve the Contractor of their ultimate responsibility for controlling paint debris from escaping the work zone.

Surface and Weather Conditions. Surfaces to be painted after cleaning shall remain free of moisture and other contaminants. The Contractor shall control his/her operations to insure that dust, dirt, or moisture does not come in contact with surfaces cleaned or painted that day.

The surface temperature shall be at least 3°C (5°F) above the dew point during final surface preparation operations. The paint manufacturers' published literature shall be followed for specific temperature, dew point, and humidity restrictions during the application of each coat.

The Contractor shall monitor temperature, dew point, and humidity every 4 hours during surface preparation and coating application in the specific areas where the work is being performed. The frequency of monitoring shall increase if weather conditions are changing. The Engineer has the right to reject any work that was performed under unfavorable weather conditions. Rejected work shall be removed, recleaned, and repainted at the Contractor's expense.

Seasonal Restrictions on Field Cleaning and Painting. Field cleaning and painting work shall be accomplished between April 15 and October 31 unless authorized otherwise by the Engineer in writing.

**Inorganic Zinc-rich/ Waterborne Acrylic Paint system.** This system shall be for shop and field application of the coating system, shop application of the intermediate and top coats will not be allowed.

In the shop, all structural steel designated to be painted shall be given one coat of inorganic zinc rich primer. In the field, before the application of the intermediate coat, the prime coat and any newly installed fasteners shall be spot solvent cleaned per SSPC-SP 1 and all surfaces pressure washed to remove dirt, oil, lubricants, oxidation products, and foreign substances. Washing shall involve the use of potable water at a pressure between 7 MPa (1000 psi) and 34 MPa (5000 psi) and according to "Low Pressure Water Cleaning" of SSPC-SP12. Paint spray equipment shall not be used to perform the water cleaning. All damaged shop primed areas shall then be spot cleaned per SSPC-SP3 and spot primed with aluminum epoxy mastic. The structural steel shall then receive one full intermediate coat and one full topcoat of waterborne acrylic paint.

- a) Paint drips, spills, and overspray must be controlled. If containment is used to control paint drips, spills, and overspray, the containment shall be dropped and all equipment secured when sustained wind speeds of 64 kph (40 mph) or greater occur. When the protective coverings need to be attached to the structure, they shall be attached by bolting, clamping, or similar means. Welding or drilling into the structure is prohibited unless approved by the Engineer in writing.
- b) Coating Dry Film Thickness (dft), measured according to SSPC-PA2:

Zinc Primer: 75 microns (3 mils) min., 150 microns (6 mils) max.  
Epoxy Mastic: 125 microns (5 mils) min., 180 microns (7 mils) max.  
Intermediate Coat: 50 microns (2 mils) min., 100 microns (4 mils) max.  
Topcoat: 50 microns (2 mils) min., 100 microns (4 mils) max.

The total dry film thickness, excluding the spot areas touched up with epoxy mastic, shall be between 180 and 355 microns (7 and 14 mils).

- c) The pressure washing requirement above may be waived if the QC and QA Inspectors verify the primed surfaces have not been contaminated.
- d) Damage to the paint system shall be spot cleaned using SSPC-SP3. The cleaned areas shall be spot painted with a penetrating sealer as recommended by the manufacturer, which shall overlap onto the existing topcoat. Then the aluminum epoxy mastic shall be spot applied not to go beyond the area painted with the sealer. The acrylic intermediate and topcoat shall be spot applied to the mastic with at least a 150 mm (6 inch) overlap onto the existing topcoat.

**Organic Zinc-Rich/ Epoxy/ Urethane Paint System.** This system shall be for full shop application of the coating system, all contact surfaces shall be masked off prior to application of the intermediate and top coats.

Additional Surface Preparation. In addition to the requirements of Section 3.2.9 of the AASHTO/AWS D1.5M/D1.5:2002 Bridge Welding Code (breaking thermal cut corners of stress carrying members), rolled and thermal cut corners to be painted with organic zinc primer shall be broken if they are sharper than a 1.5 mm (1/16 in.) radius. Corners shall be broken by a single pass of a grinder or other suitable device at a 45° angle to each adjoining surface prior to final blast cleaning, so the resulting corner approximates a 1.5 mm (1/16 in.) or larger radius after blasting. Surface anomalies (burrs, fins, deformations) shall also be treated to meet this criteria before priming.

In the shop, all structural steel designated to be painted shall be given one coat of organic zinc rich primer. Before the application of the intermediate coat, the prime coat and any newly installed fasteners shall be spot solvent cleaned per SSPC-SP 1 and all surfaces pressure washed to remove dirt, oil, lubricants, oxidation products, and foreign substances. Washing shall involve the use of potable water at a pressure between 7 MPa (1000 psi) and 34 MPa (5000 psi) and according to "Low Pressure Water Cleaning" of SSPC-SP12. Paint spray equipment shall not be used to perform the water cleaning. All damaged shop primed areas shall then be spot cleaned per SSPC-SP3, and the structural steel shall then receive one full intermediate coat of epoxy and one full topcoat of aliphatic urethane.

- (a) Paint drips, spills, and overspray must be controlled. If containment is used to control paint drips, spills, and overspray, the containment shall be dropped and all equipment secured when sustained wind speeds of 64 kph (40 mph) or greater occur. When the protective coverings need to be attached to the structure, they shall be attached by

bolting, clamping, or similar means. Welding or drilling into the structure is prohibited unless approved by the Engineer in writing.

- (b) Coating Dry Film Thickness (dft), measured according to SSPC-PA2:
  - organic Zinc Primer: 75 microns (3 mils) min., 125 microns (5 mils) max.
  - Aluminum Epoxy Mastic: 125 microns (5 mils) min., 180 microns (7 mils) max.
  - Epoxy Intermediate Coat: 75 microns (3 mils) min., 150 microns (6 mils) max.
  - Aliphatic Urethane Top Coat: 65 microns (2.5 mils) min., 100 microns (4 mils) max.
- (c) The total dry film thickness, excluding the spot areas touched up with epoxy mastic, shall be between 215 and 375 microns (8.5 and 15 mils).
- (d) When specified on the plans or as requested by the Contractor, and approved by the Engineer, the epoxy intermediate and aliphatic urethane top coats shall be applied in the shop. All faying surfaces of field connections shall be masked off after priming and shall not receive the intermediate or top coats in the shop. The intermediate and top coats for field connections shall be applied, in the field, after erection of the structural steel is completed. The pressure washing requirement above may be waived if the QC and QA Inspectors verify the primed surfaces have not been contaminated.
- (e) Erection and handling damage to the shop applied system shall be spot cleaned using SSPC-SP3. The surrounding coating at each repair location shall be feathered for a minimum distance of 40 mm (1 1/2 in.) to achieve a smooth transition between the prepared areas and the existing coating. The existing coating in the feathered area shall be roughened to insure proper adhesion of the repair coats. The areas cleaned to bare metal shall be spot painted with aluminum epoxy mastic. The intermediate and finish coat shall be spot applied to with at least a 150 mm (6 inch) overlap onto the existing finish coat.

The paint manufacturer's product data sheets shall be available for QA review in the shop and submitted to the Engineer prior to start of field work and the requirements as outlined in the data sheets shall be followed.

#### Special Instructions.

Painting Date/System Code. At the completion of the work, the Contractor shall stencil in contrasting color paint the date of painting the bridge, the painting Contractors name, and the paint type code from the Structure Information and Procedure Manual for the system used. The letters shall be capitals, not less than 50 mm (2 in.) and not more than 75 mm (3 in.) in height.

The stencil shall contain the following wording "PAINTED BY (insert the name of the painting Contractor)" and shall show the month and year in which the painting was completed, followed by "CODE S" for the Inorganic Zinc/ Acrylic System and "CODE X" for the Organic Zinc/ Epoxy/ Urethane System, all stenciled on successive lines. This information shall be stenciled on the cover plate of a truss end post near the top of the railing, or on the outside face of an outside

stringer near both ends of the bridge facing traffic, or at some equally visible surface designated by the Engineer.

Method of Measurement. Shop cleaning and painting new structures will not be measured for payment. Field cleaning and painting will not be measured for payment except when performed under a contract that contains a separate pay item for this work.

Basis of Payment. This work will be paid for according to Article 506.07.

## BRIDGE DECK LATEX CONCRETE OVERLAY

Effective: May 15, 1995

Revised: June 23, 2003

This work shall consist of the preparation of the existing concrete bridge deck and the construction of a latex overlay to the specified thickness. The minimum thickness of the overlay shall be 60 mm (2 1/4 in.).

Materials. Materials shall meet the following Articles of Section 1000:

<u>Item</u>	<u>Section</u>
(a) Latex/Portland Cement Concrete (Note 1) (Note 2)	1020
(b) Grout (Note 3)	
(c) Rapid Set Materials (Note 4)	
(d) Concrete Curing Materials (Note 5)	

Note 1: This item shall include the initial on site technical assistance of the supplier of the latex admixture. Further technical assistance shall be available at the request of the Engineer. Any cement found to be incompatible in any respect for the latex overlay shall be removed from the work immediately and replaced with compatible cement at the Contractor's expense.

The latex admixture shall be a uniform, homogeneous, non-toxic, film-forming, polymeric emulsion in water to which all stabilizers have been added at the point of manufacture. The latex admixture shall not contain any chlorides and shall contain 46 to 49 percent solids.

The Contractor shall submit a manufacturer's certification that the latex emulsion meets the requirements of FHWA Research Report RD-78-35, Chapter VI. The certificate shall include the date of manufacture of the latex admixture, batch or lot number, quantity represented, manufacturer's name, and the location of the manufacturing plant. The latex emulsion shall be sampled and tested in accordance with RD-78-35, Chapter VII, Certification Program.

The latex admixture shall be packaged and stored in containers and storage facilities which will protect the material from freezing and from temperatures above 30°C (85°F). Additionally, the material shall not be stored in direct sunlight and shall be shaded when stored outside of buildings during moderate temperatures.

Note 2: Cement shall be Type I portland cement. Fine aggregate shall be natural sand and the coarse aggregate shall be crushed stone or crushed gravel. The gradation of the coarse aggregates shall be CA 13, CA 14 or CA 16.

Note 3: Grout. The grout for bonding new concrete to old concrete shall be proportioned by mass (weight) and mixed at the job site, or it may be ready-mixed if agitated while at

the job site. The bonding grout shall consist of one part portland cement and two parts sand, mixed with sufficient water to form a slurry. The bonding grout shall have a consistency allowing it to be scrubbed onto the prepared surface with a stiff brush or broom leaving a thin, uniform coating that will not run or puddle in low spots. Grout that can not be easily and evenly applied or has lost its consistency may be rejected by the Engineer. Grout that is more than two hours old shall not be used.

At the option of the Contractor the grout may be applied by mechanical applicators. If this option is chosen, the sand shall be eliminated from the grout mix.

Note 4: Rapid set materials shall be obtained from the Department's approved list of Packaged, Dry, Rapid Hardening Cementitious Materials for Concrete Repairs.

Note 5: Cotton mats shall consist of a cotton fill material, minimum 400 g/sq m (11.8 oz/sq yd), covered with unsized cloth or burlap, minimum 200 g/sq m (5.9 oz/sq yd), and be tufted or stitched to maintain stability. Cotton mats shall be free from tears and in good condition.

Mixture Design. The latex concrete shall contain the following approximate units of measure or volumes per cubic meter (cubic yard):

Type I Portland Cement	390 kg (658 lb.)
Latex Admixture	121.3 L (24.5 gal)
Fine Aggregate	1017 kg (1715 lb.)
Coarse Aggregate	739 kg (1245 lb.)
Water (including free moisture on the fine and coarse aggregates)	93.1 kg (157 lb.) maximum

No air entraining admixtures shall be added to the mix.

This mix design is based on a specific gravity of 2.65 for both the fine and the coarse aggregates. The mix will be adjusted by the Engineer to compensate for aggregate specific gravity and moisture.

The latex concrete shall meet the following requirements:

Slump shall be according to Article 1020.12: 75 to 150 mm (3 to 6 in.)

Air Content shall be according to Article 1020.12: 7 percent maximum

Water-cement ratio (considering all the nonsolids in the latex admixture as part

of the total water)	0.30 to 0.40
Compressive Strength (14 days)	27,500 kPa (4000 psi) minimum
Flexural Strength (14 days)	4,650 kPa (675 psi)

Equipment: The equipment used shall be subject to the approval of the Engineer and shall meet the following requirements:

(a) Surface Preparation Equipment. Surface preparation equipment shall be according to the applicable portions of Section 1100 and the following:

- (1) Sawing Equipment. Sawing equipment shall be a concrete saw capable of sawing concrete to the specified depth.
- (2) Mechanical Blast Cleaning Equipment. Mechanical blast cleaning may be performed by high-pressure waterblasting or shotblasting. Mechanical blast cleaning equipment shall be capable of removing weak concrete at the surface, including the microfractured concrete surface layer remaining as a result of mechanical scarification, and shall have oil traps.

Mechanical high-pressure waterblasting equipment shall be mounted on a wheeled carriage and shall include multiple nozzles mounted on a rotating assembly. The distance between the nozzles and the deck surface shall be kept constant and the wheels shall maintain contact with the deck surface during operation.

- (3) Hand-Held Blast Cleaning Equipment. Blast cleaning using hand-held equipment may be performed by high-pressure waterblasting or abrasive blasting. Hand-held blast cleaning equipment shall have oil traps.

Hand-held high-pressure waterblasting equipment that is used in areas inaccessible to mechanical blast cleaning equipment shall have a minimum pressure of 48 MPa (7,000 psi).

- (4) Mechanical Scarifying Equipment. Scarifying equipment shall be a power-operated, mechanical scarifier capable of uniformly scarifying or removing the old concrete surface and new patches to the depths required in a satisfactory manner. Other types of removal devices may be used if their operation is suitable and they can be demonstrated to the satisfaction of the Engineer.

- (5) Hydro-Scarification Equipment. The hydro-scarification equipment shall consist of filtering and pumping units operating with a remote-controlled robotic device. The equipment shall use potable water according to Section 1002. Operation of the equipment shall be performed and supervised by qualified personnel certified by the equipment manufacturer. Evidence of certification shall be presented to the Engineer. The equipment shall be capable of removing concrete to the specified

depth and be capable of removing rust and old concrete particles from exposed reinforcement bars. The hydro-scarification equipment shall be calibrated before being used and shall operate at a uniform pressure sufficient to remove the specified depth of concrete in a timely manner.

- (6) Power-Driven Hand Tools. Power-driven hand tools will be permitted including jackhammers lighter than the nominal 20 kg (45 lb.) class. Jackhammers or chipping hammers shall not be operated at an angle in excess of 45 degrees measured from the surface of the slab.
- (b) Pull-off Test Equipment. Equipment used to perform pull-off testing shall be either approved by the Engineer, or obtained from one of the following approved sources:

James Equipment  
007 Bond Tester  
800-426-6500

Germann Instruments, Inc.  
BOND-TEST Pull-off System  
847-329-9999

SDS Company  
DYNA Pull-off Tester  
805-238-3229

Pull-off test equipment shall include all miscellaneous equipment and materials to perform the test and clean the equipment, as indicated in the Illinois Pull-off Test (Surface or Overlay Method). Prior to the start of testing, the Contractor shall submit to the Engineer a technical data sheet and material safety data sheet for the epoxy used to perform the testing. For solvents used to clean the equipment, a material safety data sheet shall be submitted.

- (c) Concrete Equipment: A mobile Portland cement concrete plant shall be used for Latex Concrete and shall be according to Articles 1020.12, 1103.04 and the following:
- (1) The device for proportioning water shall be accurate within one percent.
  - (2) The mixer shall be a self-contained, mobile, continuous mixer used in conjunction with volumetric proportioning.
  - (3) The mixer shall be calibrated prior to every placement of material or as directed by the Engineer.
- (d) Finishing Equipment. Finishing equipment shall be according to Article 503.03.
- (e) Mechanical Fogging Equipment. Mechanical fogging equipment shall consist of a mechanically operated, pressurized system using a triple headed nozzle or an equivalent nozzle. The fogging nozzle shall be capable of producing a fine, fog mist that will increase the relative humidity of the air just above the fresh concrete surface without accumulating any water on the concrete. The fogging equipment shall be mounted on



either the finishing equipment or a separate foot bridge. Controls shall be designed to vary the volume of water flow, be easily accessible and immediately shut off the water when in the off position.

- (f) Hand-Held Fogging Equipment. Hand-held fogging equipment shall use a triple headed nozzle or an equivalent nozzle. The fogging nozzle shall be capable of producing a fine, fog mist that will increase the relative humidity of the air just above the fresh concrete surface without accumulating any water on the concrete.

Construction Requirements: Sidewalks, curbs, drains, reinforcement and/or existing transverse and longitudinal joints which are to remain in place shall be protected from damage during scarification and cleaning operations. All damage caused by the Contractor shall be corrected, at the Contractor's expense, to the satisfaction of the Engineer.

The Contractor shall control the runoff water generated by the various construction activities in such a manner as to minimize, to the maximum extent practicable, the discharge of construction debris into adjacent waters, and shall properly dispose of the solids generated according to Article 202.03. Runoff water will not be allowed to constitute a hazard on adjacent or underlying roadways, waterways, drainage areas or railroads nor be allowed to erode existing slopes.

(a) Deck Preparation:

- (1) Bridge Deck Scarification. The scarification work shall consist of removing the designated concrete deck surface using mechanical or hydro-scarifying equipment as specified. The areas designated shall be scarified uniformly to the depth as specified on the plans. In areas of the deck not accessible to the scarifying equipment, power-driven hand tools will be permitted. Power driven hand tools shall be used for removal around areas to remain in place.

A trial section on the existing deck surface will be designated by the Engineer to demonstrate that the equipment, personnel and methods of operation are capable of producing results satisfactory to the Engineer. The trial section will consist of approximately 3 sq m (30 sq ft).

Once the settings for the equipment are established, they shall not be changed without the permission of the Engineer. The removal shall be verified, as necessary, at least every 5 m (16 ft) along the cutting path. If concrete is being removed below the desired depth, the equipment shall be reset or recalibrated.

If the use of hydro-scarification equipment is specified, the Contractor may use mechanical scarification equipment to remove an initial depth of concrete provided that the last 13mm (½ in.) of removal is accomplished with hydro-scarification equipment. If the Contractor's use of mechanical scarifying equipment results in exposing, snagging, or dislodging the top mat of reinforcing steel, the scarifying shall be stopped immediately and the remaining removal shall be accomplished using the hydro-scarification equipment. All damage to the existing reinforcement resulting

from the Contractor's operation shall be repaired or replaced at the Contractor's expense as directed by the Engineer. Replacement shall include the removal of any additional concrete required to position or splice the new reinforcing steel. Undercutting of exposed reinforcement bars shall only be as required to replace or repair damaged or corroded reinforcement. Repairs to existing reinforcement shall be according to the Special Provision for "Deck Slab Repair".

- (2) Deck Patching. After bridge deck scarification, all designated patching, except as note below, shall be completed according to the Special Provision for "Deck Slab Repair". All full depth patching shall be completed prior to final surface preparation. When hydro-scarification is specified, partial depth patches may be fill with overlay material at the time of overlay placement.

All patches placed prior to overlay placement shall be struck off and then roughened with a suitable stiff bristled broom or wire brush to provide a rough texture designed to promote bonding of the overlay. Hand finishing of the patch surface shall be kept to a minimum to prevent overworking of the surface.

After scarification, the deck shall be thoroughly cleaned of broken concrete and other debris. The Engineer will sound the scarified deck and all remaining unsound areas will be marked for additional removal and/or repairs as applicable. If the bottom mat of reinforcement is exposed, that area shall be defined as a full depth repair.

In areas where hydro-scarification is specified, it will be assumed that the hydro-scarification process will perform the partial depth removal simultaneously with the scarification operation. No separate payment for partial depth patching will be made regardless of whether it was detailed in the plans or not. Any removal required or made below the specified depth for scarification of the bridge deck, which does not result in full depth patching, shall be included in the pay item for Bridge Deck Hydro-Scarification and shall be filled with the overlay material at the time of the overlay placement.

- (3) Final Surface Preparation. Final surface preparation shall consist of the operation of mechanical blast cleaning equipment to remove any weak concrete at the surface, including the microfractured concrete surface layer remaining as a result of mechanical scarification. Any areas determined by the Engineer to be inaccessible to mechanical equipment shall be thoroughly blast cleaned with hand-held equipment. When hydro-scarification equipment is used for concrete removal, the deck surface need not be blast cleaned with mechanical equipment unless the spoils from the scarification operation are allowed to dry and re-solidify on the deck surface.

Final surface preparation shall also include the cleaning of all dust, debris, and concrete fines from the deck surface including vertical faces of curbs, previously placed adjacent overlays, barrier walls up to a height of 25 mm (1 in.) above the overlay, depressions, and beneath reinforcement bars. Hand-held high-pressure waterblasting equipment shall be used for this operation.

If mechanical scarification is used to produce the final deck surface texture, surface pull-off testing will be required. After the final surface preparation has been completed and before placement of the overlay, the prepared deck surface will be tested by the Engineer according to the Illinois Pull-off Test (Surface Method). The Contractor shall provide the test equipment.

- a. Start-up Testing. Prior to the first overlay placement, the Engineer will evaluate the blast cleaning method. The start-up area shall be a minimum of 56 sq m (600 sq ft). After the area has been prepared, six random test locations will be determined by the Engineer, and tested according to the Illinois Pull-off Test (Surface Method).

The average of the six tests shall be a minimum of 1,207 kPa (175 psi) and each individual test shall have a minimum strength of 1,103 kPa (160 psi). If the criteria are not met, the Contractor shall adjust the blast cleaning method. Start-up testing will be repeated until satisfactory results are attained.

Once an acceptable surface preparation method is established, it shall be continued for the balance of the work. The Contractor may, with the permission of the Engineer, change the surface preparation method, in which case, additional start-up testing will be required.

- b. Lot Testing. After start-up testing has been completed, the following testing frequency will be used. For each structure, each stage will be divided into lots of not more than 420 sq m (4500 sq ft). Three random test locations will be determined by the Engineer for each lot, and tested according to the Illinois Surface Pull-off Test Method (Surface Method).

The average of the three tests shall be a minimum of 1,207 kPa (175 psi) and each individual test shall have a minimum strength of 1,103 kPa (160 psi). In the case of a failing individual test or a failing average of three tests, the Engineer will determine the area that requires additional surface preparation by the Contractor. Additional test locations will be determined by the Engineer.

In addition to start-up and lot testing, the Department may require surface pull-off testing of areas inaccessible to mechanical blast cleaning equipment and blast cleaned with hand-held equipment. The Engineer shall determine each test location, and each individual test shall have a minimum strength of 1,207 kPa (175 psi).

Exposed reinforcement bars shall be free of dirt, detrimental scale, paint, oil, and other foreign substances which may reduce bond with the concrete. A tight non-scaling coating of rust is not considered objectionable. Loose, scaling rust shall be removed by rubbing with burlap, wire brushing, blast cleaning or other methods approved by the Engineer. All loose reinforcement bars, as determined by the Engineer, shall be retied at the Contractor's expense.

All dust, concrete fines, debris, including water, resulting from the surface preparation shall be confined and shall be immediately and thoroughly removed from all areas of accumulation. If concrete placement does not follow immediately after the final cleaning, the area shall be carefully protected with well-anchored white polyethylene sheeting.

- (b) Pre-placement Procedure. Prior to placing the overlay, the Engineer will inspect the deck surface. All contaminated areas shall be blast cleaned again at the Contractor's expense.

Before placing the overlay, the finishing machine shall be operated over the full length of bridge segment to be overlaid to check support rails for deflection and confirm the minimum overlay thickness. All necessary adjustments shall be made and another check performed, unless otherwise directed by the Engineer.

(c) Placement Procedure:

- (1) Bonding Methods. The Contractor shall prepare the deck prior to overlay placement by one of the following methods unless restricted as specified on the plans:

- a. Grout Method. The deck shall be cleaned to the satisfaction of the Engineer and shall be thoroughly wetted and maintained in a dampened condition for at least 12 hours before placement of the grout is started. Any excess water shall be removed by compressed air or by vacuuming prior to grout placement. Water shall not be applied to the deck surface within one hour before or at any time during placement of the grout. Immediately before placing the overlay mixture, the exposed area shall be thoroughly covered with a thin layer of grout. The grout shall be thoroughly scrubbed into the surface. All vertical as well as horizontal surfaces shall receive a thorough, even coating. The rate of grout placement shall be limited so the brushed grout does not dry out before it is covered with the concrete.

Grout that is allowed to become dry and chalky shall be blast cleaned and replaced at the Contractor's expense. No concrete shall be placed over dry grout.

- b. Direct Bond Method. The deck shall be cleaned to the satisfaction of the Engineer and shall be thoroughly wetted and maintained in a dampened condition with water for at least 12 hours before placement of the overlay. Any excess water shall be removed by compressed air or by vacuuming prior to the beginning of overlay placement. Water shall not be applied to the deck surface within one hour before or at any time during placement of the overlay.

- (2) Overlay Placement. For the overlay pour, fogging equipment shall be in operation unless the evaporation rate is less than 0.5 kg/m<sup>2</sup>/hr. (0.1 lb./sq. ft./hr.), and the

Engineer gives permission to turn off the equipment. The evaporation rate shall be determined according to the figure in the Portland Cement Association's publication titled "Design and Control of Concrete Mixtures" (refer to the section on plastic shrinkage cracking).

The fogging equipment shall be adjusted to adequately cover the entire width of the pour.

Hand-held fogging equipment shall be allowed only when a vibratory screed is used. The fog mist shall not be used to apply water to a specific location to aid finishing.

Placement of the concrete shall be a continuous operation throughout the pour. The overlay shall be placed as close to its final position as possible and then mechanically consolidated and screeded to final grade. All finishing and texturing shall be according to Article 503.17 except that the use of vibrating screeds will be allowed for pour widths of 3.6 m (12 feet) or less without length restrictions.

Internal vibration will be required along edges, adjacent to bulkheads, and where the overlay thickness exceeds 75 mm (3 in.). Internal vibration along the longitudinal edges of a pour will be required with a minimum of 2 hand-held vibrators, one on each edge of the pour. Hand finishing will be required along the edges of the pour and shall be done from sidewalks, curbs or work bridges.

A construction dam or bulkhead shall be installed in case of a delay of 30 minutes or more in the concrete placement operation. If there is a delay of more than ten minutes during overlay placement, wet burlap shall be used to protect the concrete until operations resume.

Concrete placement operations shall be coordinated to limit the distance between the point of concrete placement and concrete covered with cotton mats for curing. The distance shall not exceed 10.5 m (35 ft). For overlay pour widths greater than 15 m (50 ft), the distance shall not exceed 7.5 m (25 ft).

All construction joints shall be formed. When required by the Engineer the previously placed overlay shall be sawed full-depth to a straight and vertical edge before fresh concrete is placed. The Engineer will determine the extent of the removal. When longitudinal joints are not shown on the plans, the locations shall be subject to approval by the Engineer and shall not be located in the wheel paths.

The Contractor shall stencil the date of construction (month and year) and the letters LX into the overlay before it takes its final set. The stencil shall be located in a conspicuous location, as determined by the Engineer, for each stage of construction. This location shall be outside of the grooving where possible and within 1 m (3 ft) of an abutment joint. The characters shall be 75 mm to 100 mm (3 to 4 in.) in height, 5 mm (1/4 in.) in depth and face the centerline of the roadway.

(3) Limitations of Operations:

- (a) Weather Limitations. Concrete shall not be placed unless the deck temperature is above 10°C (50°F) and the air temperature is predicted to be above 10°C (50°F) for at least 12 hours after placement. The concrete shall be maintained at a minimum of 10°C (50°F) during the wet cure period. The temperature of the concrete mixture as placed shall not be less than 10°C (50°F) nor more than 32°C (90°F). If night placement is required, illumination and placement procedures will be subject to the approval of the Engineer. No additional compensation will be allowed if night work is required.
- (b) Other Limitations. Mobile concrete mixers, truck mixers, concrete pumps, or other heavy equipment will not be permitted on any portion of the deck where the top reinforcing mat has been exposed. Conveyors, buggy ramps and pump piping shall be installed in a way that will not displace undercut reinforcement bars. Air compressors may be operated on the deck only if located directly over a pier and supported off undercut reinforcement bars. Compressors will not be allowed to travel over undercut reinforcement bars.

Concrete removal may proceed during final cleaning and concrete placement on adjacent portions of the deck, provided the removal does not interfere in any way with the cleaning or placement operations.

If water or contaminants from the hydro-scarification flow into the area of final cleaning or concrete placement, hydro-scarification shall be suspended until the concrete has been placed and has cured a minimum of 24 hours. No concrete shall be removed within 1.8 m (6 ft) of a newly-placed overlay until the concrete has obtained a minimum compressive strength of 20,700 kPa (3000 psi) or flexural strength of 4,150 kPa (600 psi).

(4) Curing.

Curing. The minimum curing time shall be 48 hours of wet cure followed by 48 hours of dry cure. After the surface of the concrete has been textured, it shall be covered immediately with dry cotton mats. The cotton mats shall then be wetted immediately with a gentle spray of water. The cotton mats shall be maintained in a wetted condition for a minimum of 48 hours. Once the concrete has sufficiently hardened, the cotton mats shall be covered with white polyethylene sheeting or burlap-polyethylene blankets meeting the requirements of Articles 1022.04 and 1022.05 respectively. The surface shall be continuously wet cured for at least 48 hours, after which all layers of covering materials shall be removed.

If the ambient temperature falls below 10°C (50°F) during either the wet or dry curing periods, the time below 10°C (50°F) will not be included in the 96 hour curing period. If there is sufficient rain to wet the surface of the overlay for more than one hour of the dry cure period, the wet time will not be included in the 48 hour dry cure period.

(5) Opening to Traffic.

No traffic or construction equipment will be permitted on the overlay until after the specified cure period and the concrete has obtained a minimum compressive strength of 27,500 kPa (4000 psi) or flexural strength of 4,650 kPa (675 psi) unless permitted by the Engineer.

- (6) Overlay Testing. The Engineer reserves the right to conduct pull-off tests on the overlay to determine if any areas are not bonded to the underlying concrete, and at a time determined by the Engineer. The overlay will be tested according to the Illinois Pull-off Test (Overlay Method), and the Contractor shall provide the test equipment. Each individual test shall have a minimum strength of 1,034 kPa (150 psi). Unacceptable test results will require removal and replacement of the overlay at the Contractor's expense, and the locations will be determined by the Engineer. When removing portions of an overlay, the saw cut shall be a minimum depth of 25 mm (1 in.).

If the overlay is to remain in place, all core holes due to testing shall be filled with a rapid set mortar or concrete. Only enough water to permit placement and consolidation by rodding shall be used, and the material shall be struck-off flush with the adjacent material.

For a rapid set mortar mixture, one part packaged rapid set cement shall be combined with two parts fine aggregate, by volume; or a packaged rapid set mortar shall be used. For a rapid set concrete mixture, a packaged rapid set mortar shall be combined with coarse aggregate according to the manufacturer's instructions; or a packaged rapid set concrete shall be used. Mixing of a rapid set mortar or concrete shall be according to the manufacturer's instructions.

Method of Measurement. The areas of mechanical and/or hydro scarification on the bridge deck will be measured for payment in square meters (square yards). No additional payment will be made for multiple passes of the equipment required to achieve the specified scarification depth.

The concrete overlay will be measured for payment in square meters (square yards).

When Bridge Deck Hydro-Scarification is specified, the additional concrete placed with the overlay, required to fill all depressions below the specified thickness will be measured for payment in cubic meters (cubic yards). The volume will be determined by subtracting the theoretical volume of the overlay from the ticketed volume of overlay delivered minus the volume estimated by the Engineer left in the last truck at the end of the overlay placement. The theoretical cubic meter (cubic yard) quantity for the overlay will be determined by multiplying the plan surface area of the overlay times the specified thickness of the overlay.

Basis of Payment. Concrete scarification of the bridge deck using mechanical scarification equipment will be paid for at the contract unit price per square meter (square yard) for CONCRETE BRIDGE DECK SCARIFICATION of the thickness specified. Concrete scarification of the bridge deck using hydro scarification equipment will be paid for at the contract unit price per square meter (square yard) for BRIDGE DECK HYDRO-SCARIFICATION of the thickness specified.

Latex concrete overlay will be paid for at the contract unit price per square meter (square yard) for BRIDGE DECK LATEX CONCRETE OVERLAY, of the thickness specified. When hydro-scarification is specified, the additional volume of overlay required to fill all depressions below the specified thickness will be paid for at the Contractor's actual material cost for the latex concrete per cubic meter (cubic yard) plus 15 percent.

When mechanical scarification is specified, additional partial depth patches poured monolithically with the overlay will be paid for at the contract unit price bid per square meter (square yard) for DECK SLAB REPAIR (PARTIAL).

When the Engineer conducts pull-off tests on the overlay and they are acceptable, Contractor expenses incurred due to testing and for filling core holes will be paid according to Article 109.04. Unacceptable pull-off tests will be at the Contractor's expense.

When specified on the plans, the Contractor has the option of choosing the type of overlay. The options will be limited to those specified in the plans and will be paid for at the contract unit price per square meter (square yard) for BRIDGE DECK CONCRETE OVERLAY OPTION, of the thickness specified.

Overlay material placed off the deck in abutment backwalls, and/or other locations will not be measured for payment but will be included in the pay item involved.



## **UNDERWATER STRUCTURE EXCAVATION PROTECTION**

Effective: April 1, 1995

Revised: August 21, 2002

Description. This work shall include all labor, materials, and equipment necessary for the protection of any excavations in water that may be needed for construction at the locations shown on the plans and as required by the Specifications. The protection may consist of diverting the water for the excavation by the uses of timbers, sheet piling, approved granular embankment material or other structural elements adequate to support the excavation and need not be watertight. All concrete placement below the waterline shall be tremied underwater into forms according to Article 503.08 of the Standard Specifications. Tremied concrete shall be placed to an elevation 300 mm (1 ft) above the water level at the time of construction.

The Contractor's plan for the subject protection must be approved by the Engineer before excavation protection and construction may begin. Any system selected by the Contractor in which safe design and construction requires that loads and stresses be computed and the size and strength of parts determined by mathematical calculations based upon scientific principles and engineering data shall be prepared and sealed by an Illinois Licensed Structural Engineer. When the excavation protection is no longer required, it shall be removed unless otherwise specified by the Engineer. All materials removed will become the property of the Contractor.

Basis of Payment. Excavation protection for structures will be paid for at the contract unit price each, for UNDERWATER STRUCTURE EXCAVATION PROTECTION at the locations specified.

## **TEMPORARY SOIL RETENTION SYSTEM**

Effective: December 30, 2002

Description. This work shall consist of designing, furnishing, installing, adjusting for stage construction when required and subsequent removal of the temporary soil retention system according to the dimensions and details shown on the plans and in the approved design submittal.

General. The temporary soil retention system shall be designed by the Contractor as a minimum, to retain the exposed surface area specified in the plans or as directed by the Engineer.

The design calculations and details for the temporary soil retention system proposed by the Contractor shall be submitted to the Engineer for approval. The calculations shall be prepared and sealed by an Illinois Licensed Structural Engineer. This approval will not relieve the Contractor of responsibility for the safety of the excavation. Approval shall be contingent upon acceptance by all involved utilities and/or railroads.

Construction. The Contractor shall verify locations of all underground utilities before installing any of the soil retention system components or commencing any excavation. Any disturbance or damage to existing structures, utilities or other property, caused by the Contractor's operation, shall be repaired by the Contractor in a manner satisfactory to the Engineer at no additional cost to the Department. The soil retention system shall be installed according to the Contractor's approved design, or as directed by the Engineer, prior to commencing any related excavation. If unable to install the temporary soil retention system as specified in the approved design, the Contractor shall have the adequacy of the design re-evaluated. Any reevaluation shall be submitted to the Engineer for approval prior to commencing the excavation adjacent to the area in question. The Contractor shall not excavate below the maximum excavation line shown in the approved design without the prior permission of the Engineer. The temporary soil retention system shall remain in place until the Engineer determines it is no longer required.

The temporary soil retention system shall be removed and disposed of by the Contractor when directed by the Engineer. When allowed, the Contractor may elect to cut off a portion of the temporary soil retention system leaving the remainder in place. The remaining temporary soil retention system shall be removed to a depth which will not interfere with the new construction, and as a minimum, to a depth of 300 mm (12 in.) below the finished grade, or as directed by the Engineer. Removed system components shall become the property of the Contractor.

When an obstruction is encountered, the Contractor shall notify the Engineer and upon concurrence of the Engineer, the Contractor shall begin working to break up, push aside, or remove the obstruction. An obstruction shall be defined as any object (such as but not limited to, boulders, logs, old foundations etc.) where its presence was not obvious or specifically noted on the plans prior to bidding, that cannot be driven or installed through or around, with normal driving or installation procedures, but requires additional excavation or other procedures to remove or miss the obstruction.

Method of Measurement. The temporary soil retention system furnished and installed according to the Contractor's approved design or as directed by the Engineer will be measured for payment in place, in square meters (square feet). The area measured shall be the vertical exposed surface area envelope of the excavation supported by temporary soil retention system.

Any temporary soil retention system cut off, left in place, or installed beyond those dimensions shown on the contract plans or the approved contractor's design without the written permission of the Engineer, shall not be measured for payment but shall be done at the contractor's own expense.

Basis of Payment. This work will be paid for at the contract unit price per square meter (square foot) for TEMPORARY SOIL RETENTION SYSTEM.

Payment for any excavation, related solely to the installation and removal of the temporary soil retention system and/or its components, shall not be paid for separately but shall be included in the unit bid price for TEMPORARY SOIL RETENTION SYSTEM. Other excavation, performed in conjunction with this work, will not be included in this item but shall be paid for as specified elsewhere in this contract.

Obstruction mitigation shall be paid for according to Article 109.04 of the Standard Specifications.

## HIGH PERFORMANCE CONCRETE STRUCTURES

Effective: August 5, 2002

Revised: September 10, 2003

Description. This work shall consist of the construction of a cast-in-place high performance concrete (HPC) structure, according to the applicable portions of Section 503 of the Standard Specifications. The structural members requiring the use of HPC shall be as shown on the plans.

Mix Design. The mix design criteria for the high performance concrete structure shall meet the requirements of Article 1020.04 for Class MS and SI concrete. However, the high performance concrete structure mix design shall be selected from the following table.

Article 1020.05(b) shall apply, except that no reduction in cement content will be allowed.

Mix Design	1*	2*
Cement	264 (445)	264 (445)
Class C Fly Ash	53 (90)	53 (90)
Microsilica Solids	15 (25)	--
HRM**	--	16 (27)
Mortar Factor	0.83 – 0.86	0.83 – 0.86
W/C Ratio	0.38 – 0.44	0.38 – 0.44

Mix Design	3*	4*
Cement	264 (445)	264 (445)
GGBF Slag***	53 (90)	53 (90)
Microsilica Solids	15 (25)	--
HRM	--	16 (27)
Mortar Factor	0.83 – 0.86	0.83 – 0.86
W/C Ratio	0.38 – 0.44	0.38 – 0.44

Mix Design	5*	6*
Cement	323 (545)	323 (545)
Microsilica Solids	15 (25)	--
HRM	--	16 (27)
Mortar Factor	0.83 – 0.86	0.83 – 0.86
W/C Ratio	0.38 – 0.44	0.38 – 0.44

\*All weights in kg/m<sup>3</sup> (lbs./yd.<sup>3</sup>)

\*\*HRM – High Reactivity Metakaolin

\*\*\*GGBF Slag – Ground Granulated Blast-Furnace Slag

Mixing. The mixing requirements shall be according to Article 1020.11(d), except as follows:

(a) Water-based microsilica slurry:

(1) Truck Mixer:

- Combine simultaneously air entraining admixture, water-reducing admixture and/or retarding admixture, microsilica slurry and 80% of the water with cement, fly ash or ground granulated blast-furnace slag (if used), and aggregates.
- Add remaining water.
- Mix 30-40 revolutions at 12-15 RPM.
- Add high range water-reducing admixture.
- Mix 60-70 revolutions at 12-15 RPM.

(2) Stationary Mixer:

- The microsilica slurry shall be diluted into the water stream or weigh box prior to adding into mixer. Combine simultaneously air entraining admixture, water-reducing admixture and/or retarding admixture, microsilica slurry and 80% of the water with cement, fly ash or ground granulated blast-furnace slag (if used), and aggregates.
- Add remaining water.
- After mixing cycle is completed deposit into truck mixer.
- Add high range water-reducing admixture.
- Mix 60-70 revolutions at 12-15 RPM.

(b) Densified microsilica or high reactivity metakaolin (bulk):

(1) Truck Mixer:

- Same as (a)1 above except the densified microsilica or high reactivity metakaolin shall be added with the cement.

(2) Stationary Mixer:

- Same as (a)2 above except the densified microsilica or high reactivity metakaolin shall be added with the cement.

(c) Densified microsilica (bag):

Bagged microsilica shall be kept dry. No bag or material containing moisture shall be introduced into the concrete mixer.

(1) Truck Mixer:

- Combine air entraining admixture, water-reducing admixture and/or retarding admixture and 80% of the water.
- Add cement, fly ash or ground granulated blast-furnace slag, and aggregates.
- Add remaining water.
- Mix 30-40 revolutions at 12-15 RPM.
- Add microsilica.
- Mix 70-80 revolutions at 12-15 RPM.
- Add high range water-reducing admixture.
- Mix 60-70 revolutions at 12-15 RPM.

(2) Stationary Mixer:

- Combine air entraining admixture, water-reducing admixture and/or retarding admixture and 80% of the water.
- Add cement, fly ash or ground granulated blast-furnace slag, and aggregates.
- Add remaining water.
- After mixing cycle is completed deposit into truck mixer.
- Add microsilica to truck.
- Mix 70-80 revolutions at 12-15 RPM.
- Add high range water-reducing admixture.
- Mix 60-70 revolutions at 12-15 RPM.

(d) Undensified HRM (bag):

Bagged HRM shall be kept dry. No bag or material containing moisture shall be introduced into the concrete mixer.

(1) Truck Mixer:

- Same as (c)1, except the undensified HRM shall be added to the truck.

(2) Stationary Mixer:

- Same as (c)2, except the undensified HRM shall be added to the truck.

Method of Measurement. This work will be measured according to Article 503.21.

Basis of Payment. High performance concrete for cast-in-place structures will be paid for at the contract unit price per cubic meter (cubic yard) for HIGH PERFORMANCE CONCRETE STRUCTURE.

## REQUIRED CONTRACT PROVISIONS FEDERAL-AID CONSTRUCTION CONTRACTS

	Page
I. General .....	1
II. Nondiscrimination .....	1
III. Nonsegregated Facilities .....	3
IV. Payment of Predetermined Minimum Wage.....	3
V. Statements and Payrolls .....	6
VI. Record of Materials, Supplies, and Labor.....	7
VIII. Safety: Accident Prevention .....	7
IX. False Statements Concerning Highway Projects.....	7
X. Implementation of Clean Air Act and Federal Water Pollution Control Act .....	8
XI. Certification Regarding Debarment, Suspension, Ineligibility, and Voluntary Exclusion .....	8
XII. Certification Regarding Use of Contract Funds for Lobbying .....	9

### ATTACHMENTS

- A. Employment Preference for Appalachian Contracts  
(included in Appalachian contracts only)

#### I. GENERAL

1. These contract provisions shall apply to all work performed on the contract by the contractor's own organization and with the assistance of workers under the contractor's immediate superintendence and to all work performed on the contract by piecework, station work, or by subcontract.

2. Except as otherwise provided for in each section, the contractor shall insert in each subcontract all of the stipulations contained in these Required Contract Provisions, and further require their inclusion in any lower tier subcontract or purchase order that may in turn be made. The Required Contract Provisions shall not be incorporated by reference in any case. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with these Required Contract Provisions.

3. A breach of any of the stipulations contained in these Required Contract Provisions shall be sufficient grounds for termination of the contract.

4. A breach of the following clauses of the Required Contract Provisions may also be grounds for debarment as provided in 29 CFR 5.12:

Section I, paragraph 2;  
Section IV, paragraphs 1, 2, 3, 4 and 7;  
Section V, paragraphs 1 and 2a through 2g.

5. Disputes arising out of the labor standards provisions of Section IV (except paragraph 5) and Section V of these Required Contract Provisions shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the U.S. Department of Labor (DOL) as set forth in 29 CFR 5, 6 and 7. Disputes within the meaning of this clause include disputes between the contractor (or any of its subcontractors) and the contracting agency, the DOL, or the contractor's employees or their representatives.

6. Selection of Labor: During the performance of this contract, the contractor shall not:

a. Discriminate against labor from any other State, possession, or territory of the United States (except for employment preference for Appalachian contracts, when applicable, as specified in Attachment A), or

b. Employ convict labor for any purpose within the limits of the project unless it is labor performed by convicts who are on parole, supervised release, or probation.

#### II. NONDISCRIMINATION

1. Equal Employment Opportunity: Equal employment opportunity (EEO) requirements not to discriminate and to take affirmative action to assure equal opportunity as set forth under laws, executive orders, rules, regulations (28 CFR 35, 29 CFR 1630 and 41 CFR 60 (and orders of the Secretary of Labor as modified by the provisions prescribed herein, and imposed pursuant to 23 U.S.C. 140 shall constitute the EEO and specific affirmative action standards for the contractor's project activities under this contract. The Equal Opportunity Construction Contract Specifications set forth under 41 CFR 60-4.3 and the provisions of the American Disabilities Act of 1990 (42 U.S.C. 12101 et seq.) set forth under 28 CFR 35 and 29 CFR 1630 are incorporated by reference in this contract. In the execution of this contract, the contractor agrees to comply with the following minimum specific requirement activities of EEO:

a. The contractor will work with the State highway agency (SHA) and the Federal Government in carrying out EEO obligations and in their review of his/her activities under the contract.

b. The contractor will accept as his operating policy the following statement:

"It is the policy of this Company to assure that applicants are employed, and that employees are treated during employment, without regard to their race, religion, sex, color, national origin, age or disability. Such action shall include: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship, preapprenticeship, and/or on-the-job-training."

2. EEO Officer: The contractor will designate and make known to the SHA contracting officers an EEO Officer who will have the responsibility for an must be capable of effectively administering and promoting an active contractor program of EEO and who must be assigned adequate authority and responsibility to do so.

3. Dissemination of Policy: All members of the contractor's staff who are authorized to hire, supervise, promote, and discharge employees, or who recommend such action, or who are substantially involved in such action, will be made fully cognizant of, and will implement, the contractor's EEO policy and contractual responsibilities to provide EEO in each grade and classification of employment. To ensure that the above

agreement will be met, the following actions will be taken as a minimum:

- a. Periodic meetings of supervisory and personnel office employees will be conducted before the start of work and then not less often than once every six months, at which time the contractor's EEO policy and its implementation will be reviewed and explained. The meetings will be conducted by the EEO Officer.
  - b. All new supervisory or personnel office employees will be given a thorough indoctrination by the EEO Officer, covering all major aspects of the contractor's EEO obligations within thirty days following their reporting for duty with the contractor.
  - c. All personnel who are engaged in direct recruitment for the project will be instructed by the EEO Officer in the contractor's procedures for locating and hiring minority group employees.
  - d. Notices and posters setting forth the contractor's EEO policy will be placed in areas readily accessible to employees, applicants for employment and potential employees.
  - e. The contractor's EEO policy and the procedures to implement such policy will be brought to the attention of employees by means of meetings, employee handbooks, or other appropriate means.
4. Recruitment: When advertising for employees, the contractor will include in all advertisements for employees the notation: "An Equal Opportunity Employer." All such advertisements will be placed in publications having a large circulation among minority groups in the area from which the project work force would normally be derived.
- a. The contractor will, unless precluded by a valid bargaining agreement, conduct systematic and direct recruitment through public and private employees referral sources likely to yield qualified minority group applicants. To meet this requirement, the contractor will identify sources of potential minority group employees, and establish which such identified sources procedures whereby minority group applicants may be referred to the contractor for employment consideration.
  - b. In the event the contractor has a valid bargaining agreement providing for exclusive hiring hall referrals, he is expected to observe the provisions of that agreement to the extent that the system permits the contractor's compliance with EEO contract provisions. (The DOL has held that where implementation of such agreements have the effect of discriminating against minorities or women, or obligates the contractor to do the same, such implementation violates Executive Order 11246, as amended.)
  - c. The contractor will encourage his present employees to refer minority group applicants for employment. Information and procedures with regard to referring minority group applicants will be discussed with employees.
5. Personnel Actions: Wages, working conditions, and employee benefits shall be established and administered, and personnel actions of every type, including hiring, upgrading, promotion, transfer, demotion, layoff, and termination, shall be taken without regard to race, color, religion, sex, national origin, age or disability. The following procedures shall be followed:
- a. The contractor will conduct periodic inspections of project sites to insure that working conditions and employee facilities do not indicate discriminatory treatment of project site personnel.
  - b. The contractor will periodically evaluate the spread of wages paid within each classification to determine any

evidence of discriminatory wage practices.

- c. The contractor will periodically review selected personnel actions in depth to determine whether there is evidence of discrimination. Where evidence is found, the contractor will promptly take corrective action. If the review indicates that the discrimination may extend beyond the actions reviewed, such corrective action shall include all affected persons.
  - d. The contractor will promptly investigate all complaints of alleged discrimination made to the contractor in connection with his obligations under this contract, will attempt to resolve such complaints, and will take appropriate corrective action within a reasonable time. If the investigation indicates that the discrimination may affect persons other than the complainant, such corrective action shall include such other persons. Upon completion of each investigation, the contractor will inform every complainant of all of his avenues of appeal.
6. Training and Promotion:
- a. The contractor will assist in locating, qualifying, and increasing the skills of minority group and women employees, and applicants for employment.
  - b. Consistent with the contractor's work force requirements and as permissible under Federal and State regulations, the contractor shall make full use of training programs, i.e., apprenticeship, and on-the-job training programs for the geographical area of contract performance. Where feasible, 25 percent of apprentices or trainees in each occupation shall be in their first year of apprenticeship or training. In the event a special provision for training is provided under this contract, this subparagraph will be superseded as indicated in the special provision.
  - c. The contractor will advise employees and applicants for employment of available training programs and entrance requirements for each.
  - d. The contractor will periodically review the training and promotion potential of minority group and women employees and will encourage eligible employees to apply for such training and promotion.
7. Unions: If the contractor relies in whole or in part upon unions as a source of employees, the contractor will use his/her best efforts to obtain the cooperation of such unions to increase opportunities for minority groups and women within the unions, and to effect referrals by such unions of minority and female employees. Actions by the contractor either directly or through a contractor's association acting as agent will include the procedures set forth below:
- a. The contractor will use best efforts to develop, in cooperation with the unions, joint training programs aimed toward qualifying more minority group members and women for membership in the unions and increasing the skills of minority group employees and women so that they may qualify for higher paying employment.
  - b. The contractor will use best efforts to incorporate an EEO clause into each union agreement to the end that such union will be contractually bound to refer applicants without regard to their race, color, religion, sex, national origin, age or disability.
  - c. The contractor is to obtain information as to the referral practices and policies of the labor union except that to the extent such information is within the exclusive possession of the labor union and such labor union refuses to furnish such information to the contractor, the contractor shall so certify to



the SHA and shall set forth what efforts have been made to obtain such information.

d. In the event the union is unable to provide the contractor with a reasonable flow of minority and women referrals within the time limit set forth in the collective bargaining agreement, the contractor will, through independent recruitment efforts, fill the employment vacancies without regard to race, color, religion, sex, national origin, age or disability; making full efforts to obtain qualified and/or quailifiable minority group persons and women. (The DOL has held that it shall be no excuse that the union with which the contractor has a collective bargaining agreement providing for exclusive referral failed to refer minority employees.) In the event the union referral practice prevents the contractor from meeting the obligations pursuant to Executive Order 11246, as amended, and these special provisions, such contractor shall immediately notify the SHA.

8. Selection of Subcontractors, Procurement of Materials and Leasing of Equipment: The contractor shall not discriminate on the grounds of race, color, religion, sex, national origin, age or disability in the selection and retention of subcontractors, including procurement of materials and leases of equipment.

a. The contractor shall notify all potential subcontractors and suppliers of his/her EEO obligations under this contract.

b. Disadvantaged business enterprises (DBE), as defined in 49 CFR 23, shall have equal opportunity to compete for and perform subcontracts which the contractor enters into pursuant to this contract. The contractor will use his best efforts to solicit bids from and to utilize DBE subcontractors or subcontractors with meaningful minority group and female representation among their employees. Contractors shall obtain lists of DBE construction firms from SHA personnel.

c. The contractor will use his best efforts to ensure subcontractor compliance with their EEO obligations.

9. Records and Reports: The contractor shall keep such records as necessary to document compliance with the EEO requirements. Such records shall be retained for a period of three years following completion of the contract work and shall be available at reasonable times and places for inspection by authorized representatives of the SHA and the FHWA.

a. The records kept by the contractor shall document the following:

(1) The number of minority and non-minority group members and women employed in each work classification on the project;

(2) The progress and efforts being made in cooperation with unions, when applicable, to increase employment opportunities for minorities and women;

(3) The progress and efforts being made in locating, hiring, training, qualifying, and upgrading minority and female employees; and

(4) The progress and efforts being made in securing the services of DBE subcontractors or subcontractors with meaningful minority and female representation among their employees.

b. The contractors will submit an annual report to the SHA each July for the duration of the project, indicating the number of minority, women, and non-minority group employees currently engaged in each work classification required by the contract work. This information is to be reported on Form FHWA-1391. If on-the-job training is being required by special provision, the contractor will be required to collect and report training data.

### III. NONSEGREGATED FACILITIES

(Applicable to all Federal-aid construction contracts and to all related subcontracts of \$10,000 or more.)

a. By submission of this bid, the execution of this contract or subcontract, or the consummation of this material supply agreement or purchase order, as appropriate, the bidder, Federal-aid construction contractor, subcontractor, material supplier, or vendor, as appropriate, certifies that the firm does not maintain or provide for its employees any segregated facilities at any of its establishments, and that the firm does not permit its employees to perform their services at any location, under its control, where segregated facilities are maintained. The firm agrees that a breach of this certification is a violation of the EEO provisions of this contract. The firm further certifies that no employee will be denied access to adequate facilities on the basis of sex or disability.

b. As used in this certification, the term "segregated facilities" means any waiting rooms, work areas, restrooms and washrooms, restaurants and other eating areas, timeclocks, locker rooms, and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing facilities provided for employees which are segregated by explicit directive, or are, in fact, segregated on the basis of race, color, religion, national origin, age or disability, because of habit, local custom, or otherwise. The only exception will be for the disabled when the demands for accessibility override (e.g. disabled parking).

c. The contractor agrees that it has obtained or will obtain identical certification from proposed subcontractors or material suppliers prior to award of subcontracts or consummation of material supply agreements of \$10,000 or more and that it will retain such certifications in its files.

### IV. PAYMENT OF PREDETERMINED MINIMUM WAGE

(Applicable to all Federal-aid construction contracts exceeding \$2,000 and to all related subcontracts, except for projects located on roadways classified as local roads or rural minor collectors, which are exempt.)

#### 1. General:

a. All mechanics and laborers employed or working upon the site of the work will be paid unconditionally and not less often than once a week and without subsequent deduction or rebate on any account [except such payroll deductions as are permitted by regulations (29 CFR 3) issued by the Secretary of Labor under the Copeland Act (40 U.S.C. 276c)] the full amounts of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment. The payment shall be computed at wage rates not less than those contained in the wage determination of the Secretary of Labor (hereinafter "the wage determination") which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the

contractor or its subcontractors and such laborers and mechanics. The wage determination (including any additional classifications and wage rates conformed under paragraph 2 of this Section IV and the DOL poster (WH-1321) or Form FHWA-1495) shall be posted at all times by the contractor and its subcontractors at the site of the work in a prominent and accessible place where it can be easily seen by the workers. For the purpose of this Section, contributions made or costs reasonably anticipated for bona fide fringe benefits under Section 1(b)(2) of the Davis-Bacon Act (40 U.S.C. 276a) on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of Section IV, paragraph 3b, hereof. Also, for the purpose of this Section, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs, which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period. Such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits on the wage determination for the classification of work actually performed, without regard to skill, except as provided in paragraphs 4 and 5 of this Section IV.

b. Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein, provided, that the employer's payroll records accurately set forth the time spent in each classification in which work is performed.

c. All rulings and interpretations of the Davis-Bacon Act and related acts contained in 29 CFR 1, 3, and 5 are herein incorporated by reference in this contract.

## 2. Classification:

a. The SHA contracting officer shall require that any class of laborers or mechanics employed under the contract, which is not listed in the wage determination, shall be classified in conformance with the wage determination.

b. The contracting officer shall approve an additional classification, wage rate and fringe benefits only when the following criteria have been met:

(1) the work to be performed by the additional classification requested is not performed by a classification in the wage determination;

(2) the additional classification is utilized in the area by the construction industry;

(3) the proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination; and

(4) with respect to helpers, when such a classification prevails in the area in which the work is performed.

c. If the contractor or subcontractors, as appropriate, the laborers and mechanics (if known) to be employed in the additional classification or their representatives, and the contracting officer agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), a report of the action taken shall be sent by the contracting officer to the DOL, Administrator of the Wage and Hour Division, Employment Standards Administration, Washington, D.C. 20210. The Wage and Hour Administrator, or an authorized representative, will approve, modify, or

disapprove every additional classification action within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.

d. In the event the contractor or subcontractors, as appropriate, the laborers or mechanics to be employed in the additional classification or their representatives, and the contracting officer do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), the contracting officer shall refer the question, including the views of all interested parties and the recommendation of the contracting officer, to the Wage and Hour Administrator for determination. Said Administrator, or an authorized representative, will issue a determination within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.

e. The wage rate (including fringe benefits where appropriate) determined pursuant to paragraph 2c or 2d of this Section IV shall be paid to all workers performing work in the additional classification from the first day on which work is performed in the classification.

## 3. Payment of Fringe Benefits:

a. Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the contractor or subcontractors, as appropriate, shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly case equivalent thereof.

b. If the contractor or subcontractor, as appropriate, does not make payments to a trustee or other third person, he/she may consider as a part of the wages of any laborer or mechanic the amount of any cost reasonably anticipated in providing bona fide fringe benefits under a plan or program, provided that the Secretary of Labor has found, upon the written request of the contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the contractor to set aside in a separate account assets for the meeting of obligations under the plan or program.

## 4. Apprentices and Trainees (Programs of the U.S. DOL) and Helpers:

### a. Apprentices:

(1) Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the DOL, Employment and Training Administration, Bureau of Apprenticeship and Training, or with a State apprenticeship agency recognized by the Bureau, or if a person is employed in his/her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by the Bureau of Apprenticeship and Training or a State apprenticeship agency (where appropriate) to be eligible for probationary employment as an apprentice.

(2) The allowable ratio of apprentices to journeyman-level employees on the job site in any craft classification shall not

be greater than the ratio permitted to the contractor as to the entire work force under the registered program. Any employee listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated above, shall be paid not less than the applicable wage rate listed in the wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a contractor or subcontractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman-level hourly rate) specified in the contractor's or subcontractor's registered program shall be observed.

(3) Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeyman-level hourly rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator for the Wage and Hour Division determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination.

(4) In the event the Bureau of Apprenticeship and Training, or a State apprenticeship agency recognized by the Bureau, withdraws approval of an apprenticeship program, the contractor or subcontractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the comparable work performed by regular employees until an acceptable program is approved.

b. Trainees:

(1) Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the DOL, Employment and Training Administration.

(2) The ratio of trainees to journeyman-level employees on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by the Employment and Training Administration shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed.

(3) Every trainee must be paid at not less than the rate specified in the approved program for his/her level of progress, expressed as a percentage of the journeyman-level hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits

Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman-level wage rate on the wage determination which provides for less than full fringe benefits for apprentices, in which cases such trainees shall receive the same fringe benefits as apprentices.

(4) In the event the Employment and Training Administration withdraws approval of a training program, the contractor or subcontractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

c. Helpers:

Helpers will be permitted to work on a project if the helper classification is specified and defined on the applicable wage determination or is approved pursuant to the conformance procedure set forth in Section IV. 2. Any worker listed on a payroll at a helper wage rate, who is not a helper under a approved definition, shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed.

5. Apprentices and Trainees (Programs of the U.S. DOT):

Apprentices and trainees working under apprenticeship and skill training programs which have been certified by the Secretary of Transportation as promoting EEO in connection with Federal-aid highway construction programs are not subject to the requirements of paragraph 4 of this Section IV. The straight time hourly wage rates for apprentices and trainees under such programs will be established by the particular programs. The ratio of apprentices and trainees to journeymen shall not be greater than permitted by the terms of the particular program.

6. Withholding:

The SHA shall upon its own action or upon written request of an authorized representative of the DOL withhold, or cause to be withheld, from the contractor or subcontractor under this contract or any other Federal contract with the same prime contractor or any other Federally-assisted contract subject to Davis-Bacon prevailing wage requirements which is held by the same prime contractor, as much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainee's and helpers, employed by the contractor or any subcontractor the full amount of wages required by the contract. In the event of failure to pay any laborer or mechanic, including any apprentice, trainee, or helper, employed or working on the site of the work, all or part of the wages required by the contract, the SHA contracting officer may, after written notice to the contractor, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased.

7. Overtime Requirements:

No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers, mechanics, watchmen, or guards (including apprentices, trainees, and helpers described in paragraphs 4 and 5 above) shall require or permit any laborer, mechanic, watchman, or guard in any workweek in which he/she is employed on such work, to work in excess of 40 hours in such workweek unless such laborer, mechanic, watchman, or guard receives compensation at a rate not less than one-and-one-half times his/her basic rate of pay for all hours worked in excess of 40 hours in such workweek.

## 8. Violation:

Liability for Unpaid Wages; Liquidated Damages: In the event of any violation of the clause set forth in paragraph 7 above, the contractor and any subcontractor responsible thereof shall be liable to the affected employee for his/her unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory) for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer, mechanic, watchman, or guard employed in violation of the clause set forth in paragraph 7, in the sum of \$10 for each calendar day on which such employee was required or permitted to work in excess of the standard work week of 40 hours without payment of the overtime wages required by the clause set forth in paragraph 7.

## 9. Withholding for Unpaid Wages and Liquidated Damages:

The SHA shall; upon its own action or upon written request of any authorized representative of the DOL withhold, or cause to be withheld, from any monies payable on account of work performed by the contractor or subcontractor under any such contract or any other Federal contract with the same prime contractor, or any other Federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph 8 above.

## V. STATEMENTS AND PAYROLLS

(Applicable to all Federal-aid construction contracts exceeding \$2,000 and to all related subcontracts, except for projects located on roadways classified as local roads or rural collectors, which are exempt.)

### 1. Compliance with Copeland Regulations (29 CFR 3):

The contractor shall comply with the Copeland Regulations of the Secretary of Labor which are herein incorporated by reference.

### 2. Payrolls and Payroll Records:

a. Payrolls and basic records relating thereto shall be maintained by the contractor and each subcontractor during the course of the work and preserved for a period of 3 years from the date of completion of the contract for all laborers, mechanics, apprentices, trainees, watchmen, helpers, and guards working at the site of the work.

b. The payroll records shall contain the name, social security number, and address of each such employee; his or her correct classification; hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalent thereof the types described in Section 1(b)(2)(B) of the Davis Bacon Act); daily and weekly number of hours worked; deductions made; and actual wages paid. In addition, for Appalachian contracts, the payroll records shall contain a notation indicating whether the employee does, or does not, normally reside in the labor area as defined in Attachment A, paragraph 1. Whenever the Secretary of Labor, pursuant to Section IV, paragraph 3b, has found that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan

or program described in Section 1(b)(2)(B) of the Davis Bacon Act, the contractor and each subcontractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, that the plan or program has been communicated in writing to the laborers or mechanics affected, and show the cost anticipated or the actual cost incurred in providing benefits. Contractors or subcontractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprentices and trainees, and ratios and wage rates prescribed in the applicable programs.

c. Each contractor and subcontractor shall furnish, each week in which any contract work is performed, to the SHA resident engineer a payroll of wages paid each of its employees (including apprentices trainees, and helpers, described in Section IV, paragraphs 4 and 5, and watchmen and guards engaged on work during the preceding weekly payroll period).

The payroll submitted shall set out accurately and completely all of the information required to be maintained under paragraph 2b of this Section V.

This information may be submitted in any form desired. Optional Form WH-347 is available for this purpose and may be purchased from the Superintendent of Documents (Federal stock number 029-005-0014-1), U.S. Government Printing Office, Washington, D.C. 20402. The prime contractor is responsible for the submission of copies of payrolls by all subcontractors.

d. Each payroll submitted shall be accompanied by a "Statement of Compliance," signed by the Contractor or subcontractor or his/her agent who pays or supervises the payment of the persons employed under the contract and shall certify the following:

(1) that the payroll for the payroll period contains the information required to be maintained under paragraph 2b of this Section V and that such information is correct and complete;

(2) that such laborer or mechanic (including each helper, apprentice, and trainee) employed on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in the Regulations, 29 CFR 3;

(3) that each laborer or mechanic has been paid not less than the applicable wage rate and fringe benefits or cash equivalent for the classification of work performed, as specified in the applicable wage determination incorporated into the contract.

e. The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH-347 shall satisfy the requirement for submission of the "Statement of Compliance" required by paragraph 2d of this Section V.

f. The falsification of any of the above certifications may subject the contractor to civil or criminal prosecution under 18 U.S. C. 1001 and 31 U.S.C. 231.

g. The contractor or subcontractor shall make the records required under paragraph 2b of this Section V available for

inspection, copying, or transcription by authorized representatives of the SHA, the FHWA, or the DOL, and shall permit such representatives to interview employees during working hours on the job. If the contractor or subcontractor fails to submit the required records or to make them available, the SHA, the FHWA, the DOL, or all may, after written notice to the contractor, sponsor, applicant, or owner, take such actions as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR 5.12.

## **VI. RECORD OF MATERIALS, SUPPLIES, AND LABOR**

1. On all federal-aid contracts on the national highway system, except those which provide solely for the installation of protective devices at railroad grade crossings, those which are constructed on a force account or direct labor basis, highway beautification contracts, and contracts for which the total final construction cost for roadway and bridge is less than \$1,000,000 (23 CFR 635) the contractor shall:

- a. Become familiar with the list of specific materials and supplies contained in Form FHWA-47, "Statement of Materials and Labor Used by Contractor of Highway Construction Involving Federal Funds," prior to the commencement of work under this contract.
- b. Maintain a record of the total cost of all materials and supplies purchased for and incorporated in the work, and also of the quantities of those specific materials and supplies listed on Form FHWA-47, and in the units shown on Form FHWA-47.
- c. Furnish, upon the completion of the contract, to the SHA resident engineer on /Form FHWA-47 together with the data required in paragraph 1b relative to materials and supplies, a final labor summary of all contract work indicating the total hours worked and the total amount earned.

2. At the prime contractor's option, either a single report covering all contract work or separate reports for the contractor and for each subcontract shall be submitted.

## **VII. SUBLETTING OR ASSIGNING THE CONTRACT**

1. The contractor shall perform with its own organization contract work amounting to not less than 30 percent (or a greater percentage if specified elsewhere in the contract) of the total original contract price, excluding any specialty items designated by the State. Specialty items may be performed by subcontract and the amount of any such specialty items performed may be deducted from the total original contract price before computing the amount of work required to be performed by the contractor's own organization (23 CFR 635).

- a. "Its own organization" shall be construed to include only workers employed and paid directly by the prime contractor and equipment owned or rented by the prime contractor, with or without operators. Such term does not include employees or equipment of a subcontractor, assignee, or agent of the prime contractor.
- b. "Specialty Items" shall be construed to be limited to work that requires highly specialized knowledge, abilities, or equipment not ordinarily available in the type of contracting organizations qualified and expected to bid on the contract as a

whole and in general are to be limited to minor components of the overall contract.

2. The contract amount upon which the requirements set forth in paragraph 1 of Section VII is computed includes the cost of material and manufactured products which are to be purchased or produced by the contractor under the contract provisions.

3. The contractor shall furnish (a) a competent superintendent or supervisor who is employed by the firm, has full authority to direct performance of the work in accordance with the contract requirements, and is in charge of all construction operations (regardless of who performs the work) and (b) such other of its own organizational resources (supervision, management, and engineering services) as the SHA contracting officer determines is necessary to assure the performance of the contract.

4. No portion of the contract shall be sublet, assigned or otherwise disposed of except with the written consent of the SHA contracting officer, or authorized representative, and such consent when given shall not be construed to relieve the contractor of any responsibility for the fulfillment of the contract.

Written consent will be given only after the SHA has assured that each subcontract is evidenced in writing and that it contains all pertinent provisions and requirements of the prime contract.

## **VIII. SAFETY: ACCIDENT PREVENTION**

1. In the performance of this contract the contractor shall comply with all applicable Federal, State, and local laws governing safety, health, and sanitation (23 CFR 635). The contractor shall provide all safeguards, safety devices and protective equipment and take any other needed actions as it determines, or as the SHA contracting officer may determine, to be reasonably necessary to protect the life and health of employees on the job and the safety of the public and to protect property in connection with the performance of the work covered by the contract.

2. It is a condition of this contract, and shall be made a condition of each subcontract, which the contractor enters into pursuant to this contract, that the contractor and any subcontractor shall not permit any employee, in performance of the contract, to work in surroundings or under conditions which are unsanitary, hazardous or dangerous to his/her health or safety, as determined under construction safety and health standards (29 CFR 1926) promulgated by the Secretary of Labor, in accordance with Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C. 333).

3. Pursuant to 29 CFR 1926.3, it is a condition of this contract that the Secretary of Labor or authorized representative thereof, shall have right of entry to any site of contract performance to inspect or investigate the matter of compliance with the construction safety and health standards and to carry out the duties of the Secretary under Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C. 333).

## **IX. FALSE STATEMENTS CONCERNING HIGHWAY PROJECTS**

In order to assure high quality and durable construction in conformity with approved plans and specifications and a high degree of reliability on statements and representations made by engineers, contractors, suppliers, and workers on Federal-aid highway projects, it is essential that all persons concerned with the project perform their functions as carefully, thoroughly, and honestly as possible. Willful falsification,

distortion, or misrepresentation with respect to any facts related to the project is a violation of Federal law. To prevent any misunderstanding regarding the seriousness of these and similar acts, the following notice shall be posted on each Federal-aid highway project (23 CFR 635) in one or more places where it is readily available to all persons concerned with the project:

#### **NOTICE TO ALL PERSONNEL ENGAGED ON FEDERAL-AID HIGHWAY PROJECTS**

18 U.S.C. 1020 reads as follows:

*"Whoever, being an officer, agent or employee of the United States, or of any State or Territory, or whoever, whether a person, association, firm, or corporation, knowingly makes any false statement, false representation, or false report as to the character, quality, quantity, or cost of the material used or to be used, or the quantity or quality of the work performed or to be performed, or the cost thereof in connection with the submission of plans, maps, specifications, contracts, or costs of construction on any highway or related project submitted for approval to the Secretary of Transportation; or*

*Whoever knowingly makes any false statement, false representation, false report or false claim with respect to the character, quality, quantity, or cost of any work performed or to be performed, or materials furnished or to be furnished, in connection with the construction of any highway or related project approved by the Secretary of Transportation; or*

*Whoever knowingly makes any false statement or false representation as to material fact in any statement, certificate, or report submitted pursuant to provisions of the Federal-aid Roads Act approved July 1, 1916, (39 Stat. 355), as amended and supplemented;*

*Shall be fined not more than \$10,000 or imprisoned not more than 5 years or both."*

#### **X. IMPLEMENTATION OF CLEAN AIR ACT AND FEDERAL WATER POLLUTION CONTROL ACT**

(Applicable to all Federal-aid construction contracts and to all related subcontracts of \$100,000 or more).

By submission of this bid or the execution of this contract, or subcontract, as appropriate, the bidder, Federal-aid construction contractor, or subcontractor, as appropriate, will be deemed to have stipulated as follows:

1. That any facility that is or will be utilized in the performance of this contract, unless such contract is exempt under the Clean Air Act, as amended (42 U.S.C. 1857 et seq., as amended by Pub.L. 91-604), and under the Federal Water Pollution Control Act, as amended (33 U.S.C. 1251 et seq., as amended by Pub.L. 92-500), Executive Order 11738, and regulations in implementation thereof (40 CFR 15) is not listed, on the date of contract award, on the U.S. Environmental Protection Agency (EPA) List of Violating Facilities pursuant to 40 CFR 15.20.

2. That the firm agrees to comply and remain in compliance with all the requirements of Section 114 of the Clean Air Act and Section 308 of the Federal Water Pollution Control Act and all regulations and guidelines listed thereunder.

3. That the firm shall promptly notify the SHA of the receipt of

any communication from the Director, Office of Federal Activities, EPA indicating that a facility that is or will be utilized for the contract is under consideration to be listed on the EPA List of Violating Facilities.

4. That the firm agrees to include or cause to be included the requirements of paragraph 1 through 4 of this Section X in every nonexempt subcontract, and further agrees to take such action as the government may direct as a means of enforcing such requirements.

#### **XI. CERTIFICATION REGARDING DEBARMENT, SUSPENSION, INELIGIBILITY AND VOLUNTARY EXCLUSION**

1. Instructions for Certification - Primary Covered Transactions:

(Applicable to all Federal-aid contracts - 49 CFR 29)

a. By signing and submitting this proposal, the prospective primary participant is providing the certification set out below.

b. The inability of a person to provide the certification set out below will not necessarily result in denial of participation in this covered transaction. The prospective participant shall submit an explanation of why it cannot provide the certification set out below. The certification or explanation will be considered in connection with the department or agency's determination whether to enter into this transaction. However, failure of the prospective primary participant to furnish a certification or an explanation shall disqualify such a person from participation in this transaction.

c. The certification in this clause is a material representation of fact upon which reliance was placed when the department or agency determined to enter into this transaction. If it is later determined that the prospective primary participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the department or agency may terminate this transaction for cause of default.

d. The prospective primary participant shall provide immediate written notice to the department or agency to whom this proposal is submitted if any time the prospective primary participant learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances.

e. The terms "covered transaction," "debarred," "suspended," "ineligible," "lower tier covered transaction," "participant," "person," "primary covered transaction," "principal," "proposal," and "voluntarily excluded," as used in this clause, have the meanings set out in the Definitions and Coverage sections of rules implementing Executive Order 12549. You may contact the department or agency to which this proposal is submitted for assistance in obtaining a copy of those regulations.

f. The prospective primary participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency entering into this transaction.

g. The prospective primary participant further agrees by submitting this proposal that it will include the clause titled

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"Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transaction," provided by the department or agency entering into this covered transaction, without modification in all lower tier covered transactions and in all solicitations for lower tier covered transactions.

h. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant may decide the method and frequency by which it determines the eligibility of its principals. Each participant may, but is not required to, check the nonprocurement portion of the "Lists of Parties Excluded from Federal Procurement or Nonprocurement Programs" (Nonprocurement List) which is compiled by the General Services Administration.

i. Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

j. Except for transactions authorized under paragraph f of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency may terminate this transaction for cause or default.

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#### **Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Primary Covered Transactions**

1. The prospective primary participant certifies to the best of its knowledge and belief, that it and its principals:

- a. Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency;
- b. Have not within a 3-year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;
- c. Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or local) with commission of any of the offenses enumerated in paragraph 1b of this certification; and
- d. Have not within a 3-year period preceding this application/proposal had one or more public transactions (Federal, State or local) terminated for cause or default.

2. Where the prospective primary participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

#### **2. Instructions for Certification - Lower Tier Covered Transactions:**

(Applicable to all subcontracts, purchase orders and other lower tier transactions of \$25,000 or more - 49 CFR 29)

a. By signing and submitting this proposal, the prospective lower tier is providing the certification set out below.

b. The certification in this clause is a material representation of fact upon which reliance was placed when this transaction was entered into. If it is later determined that the prospective lower tier participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the department, or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.

c. The prospective lower tier participant shall provide immediate written notice to the person to which this proposal is submitted if at any time the prospective lower tier participant learns that its certification was erroneous by reason of changed circumstances.

d. The terms "covered transaction," "debarred," "suspended," "ineligible," "primary covered transaction," "participant," "person," "principal," "proposal," and "voluntarily excluded," as used in this clause, have the meanings set out in the Definitions and Coverage sections of rules implementing Executive Order 12549. You may contact the person to which this proposal is submitted for assistance in obtaining a copy of those regulations.

e. The prospective lower tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency with which this transaction originated.

f. The prospective lower tier participant further agrees by submitting this proposal that it will include this clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transaction," without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions.

g. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant may decide the method and frequency by which it determines the eligibility of its principals. Each participant may, but is not required to, check the Nonprocurement List.

h. Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealing.

i. Except for transactions authorized under paragraph e of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily

excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.

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**Certification Regarding Debarment, Suspension, Ineligibility And Voluntary Exclusion-Lower Tier Covered Transactions:**

1. The prospective lower tier participant certifies, by submission of this proposal, that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any Federal department or agency.

2. Where the prospective lower tier participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

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**XII. CERTIFICATION REGARDING USE OF CONTRACT FUNDS FOR LOBBYING**

(Applicable to all Federal-aid construction contracts and to all related subcontracts which exceed \$100,000 - 49 CFR 20)

1. The prospective participant certifies, by signing and submitting this bid or proposal, to the best of his or her knowledge and belief, that:

a. No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

b. If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

2. This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by 31 U.S.C. 1352. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

3. The prospective participant also agrees by submitting his or her bid or proposal that he or she shall require that the language of this certification be included in all lower tier subcontracts, which exceed \$100,000 and that all such recipients shall certify and disclose accordingly.



## **MINIMUM WAGES FOR FEDERAL AND FEDERALLY ASSISTED CONSTRUCTION CONTRACTS**

This project is funded, in part, with Federal-aid funds and, as such, is subject to the provisions of the Davis-Bacon Act of March 3, 1931, as amended (46 Sta. 1494, as amended, 40 U.S.C. 276a) and of other Federal statutes referred to in a 29 CFR Part 1, Appendix A, as well as such additional statutes as may from time to time be enacted containing provisions for the payment of wages determined to be prevailing by the Secretary of Labor in accordance with the Davis-Bacon Act and pursuant to the provisions of 29 CFR Part 1. The prevailing rates and fringe benefits shown in the General Wage Determination Decisions issued by the U.S. Department of Labor shall, in accordance with the provisions of the foregoing statutes, constitute the minimum wages payable on Federal and federally assisted construction projects to laborers and mechanics of the specified classes engaged on contract work of the character and in the localities described therein.

General Wage Determination Decisions, modifications and supersedes decisions thereto are to be used in accordance with the provisions of 29 CFR Parts 1 and 5. Accordingly, the applicable decision, together with any modifications issued, must be made a part of every contract for performance of the described work within the geographic area indicated as required by an applicable DBRA Federal prevailing wage law and 29 CFR Part 5. The wage rates and fringe benefits contained in the General Wage Determination Decision

### **NOTICE**

The most current **General Wage Determination Decisions** (wage rates) are available on the IDOT web site. They are located on the Letting and Bidding page at <http://www.dot.il.gov/desenv/delett.html>.

In addition, ten (10) days prior to the letting, the applicable Federal wage rates will be e-mailed to subscribers. It is recommended that all contractors subscribe to the Federal Wage Rates List or the Contractor's Packet through IDOT's subscription service.

PLEASE NOTE: if you have already subscribed to the Contractor's Packet you will automatically receive the Federal Wage Rates.

The instructions for subscribing are at <http://www.dot.il.gov/desenv/subsc.html>.

If you have any questions concerning the wage rates, please contact IDOT's Chief Contract Official at 217-782-7806.